

SERVICE MANUAL

HP 7580B DRAFTING PLOTTER



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SERVICE MANUAL

HP 7580B DRAFTING PLOTTER

SERIAL NUMBERS

This manual applies directly to plotters with serial numbers prefixed 2644A.

With changes described in Section V, this manual also applies to plotters with serial numbers prefixed below 2644A.

For additional important information about serial numbers, see PLOTTERS COVERED BY MANUAL in Section I.

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MANUAL PART NO. 07580-90022

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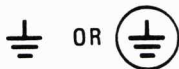
General Definitions of Safety Symbols Used On Equipment



International caution symbol (refer to manual): the product will be marked with this symbol when it is necessary for the user to refer to the instruction manual in order to protect against damage to the instrument.



Indicates dangerous voltage (terminals fed from the interior by voltage exceeding 1000 volts must be so marked).



Protective conductor terminal. For protection against electrical shock in case of a fault. Used with field wiring terminals to indicate the terminal which must be connected to ground before operating equipment.



Low-noise or noiseless, clean ground (earth) terminal. Used for a signal common, as well as providing protection against electrical shock in case of a fault. A terminal marked with this symbol must be connected to ground in the manner described in the installation (operating) manual, and before operating the equipment.



Frame or chassis terminal. A connection to the frame (chassis) of the equipment which normally includes all exposed metal structures.



Alternating current



Direct current



Alternating or direct current



The WARNING sign denotes a hazard. It calls attention to a procedure, practice, or the like, which, if not correctly performed or adhered to, could result in personal injury.



The CAUTION sign denotes a hazard. It calls attention to an operating procedure, practice, or the like, which if not correctly performed or adhered to, could result in damage to or destruction of part or all of the product.



7585-A-20-1

Figure 1-1. Hewlett-Packard Model 7580B Drafting Plotter

SECTION I

GENERAL INFORMATION

1-1. INTRODUCTION

1-2. This Service Manual contains information necessary to test, adjust, and service the Hewlett-Packard Model 7580B Drafting Plotter, which is shown in Figure 1-1. For ease of reference, this manual is divided into six sections and one appendix, as follows:

SECTION I	GENERAL INFORMATION
SECTION II	PERFORMANCE TESTS
SECTION III	ADJUSTMENTS
SECTION IV	REPLACEABLE PARTS
SECTION V	PRODUCT HISTORY
SECTION VI	SERVICE
APPENDIX A	HP-IB/RS-232-C (DUAL I/O) INTERFACE

1-3. Herein the Hewlett-Packard Model 7580B Drafting Plotter will also be referred to as the Model 7580B and/or the plotter. The eight-pen carousel may also be referred to as the pen turret or turret.

1-4. Information on interfacing, operating, and programming of the Model 7580B is contained in the HP Model 7580B and Model 7585B Operating and Programming Manual, HP Part Number 07580-90024, which is supplied with the plotter.

1-5. Additional pen and media information is contained in the HP Model 7580B and Model 7585B Operator's Manual, HP Part Number 07580-90023, also supplied with the plotter.

1-6. SPECIFICATIONS

1-7. Plotter specifications are listed in Table 1-1. These specifications are the performance standards or limits against which the plotter is tested. Table 1-2 lists supplemental characteristics. Supplemental characteristics are not specifications, but are typical characteristics included as additional information for the user.

1-8. SAFETY CONSIDERATIONS

1-9. This is a Safety Class I instrument (provided with terminal for protective earthing) and has been manufactured and tested according to international safety standards.

1-10. Safety symbols used with Hewlett-Packard instruments are illustrated on page v of the front matter. The safety considerations, symbols, and instructions should be reviewed before service work is performed. **BEFORE APPLYING POWER**, verify that the voltage selector

Table 1-1. Plotter Specifications

Resolution	
Smallest addressable move	0.025 mm (0.000984 in.)
Mechanical resolution	0.003 mm (0.00012 in.)
Repeatability (for a given pen)	
On paper, vellum or 0.75 mm (0.003 in.) double-matte polyester film at 18–30° C	0.10 mm (0.004 in.)
Endpoint Accuracy	
On 0.075 mm (0.003 in.) double-matte polyester film at 18–30° C, level floor	0.1 % of the move or 0.25 mm (0.0098 in.), whichever is greater

NOTE: Specifications apply only when using HP authorized supplies.

switches are set to match the available line voltage and the correct rated fuse is installed.

1-11. PLOTTERS COVERED BY MANUAL

1-12. The plotter serial number plate is attached to the right-hand side of the rear cover. See Figure 1-2. The serial number prefix consists of the first four digits and letter and is the same for all identical plotters.

1-13. The serial number prefix only changes when a change is made to the plotter. The serial number suffix consists of the last five digits and is assigned sequentially, thereby differing for each plotter. The contents of

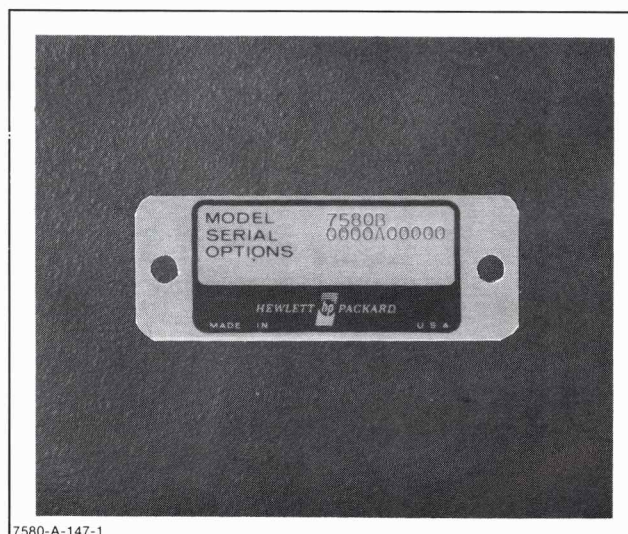


Figure 1-2. Model 7580B Identification

this manual apply directly to plotters with the serial number prefix(es) listed under SERIAL NUMBERS on the title page.

1-14. If the serial number prefix of your plotter is higher than the one shown on the title page, one or more of the Update Packages supplied with the manual must be folded in. This will ensure that this manual applies directly to your plotter. See Manual Update Package for instructions.

1-15. If the serial number prefix of your plotter is lower than the one shown on the title page, information in the Product History section, Section V, will adapt this manual to that plotter.

1-16. DESCRIPTION

1-17. The Hewlett-Packard Model 7580B Drafting Plotter is a microprocessor controlled plotter providing graphic displays of computer program output data. The Model 7580B operates with a number of HP computer systems, graphic terminals, and desktop computers to produce printed and/or graphic copy. The Model 7580B can be used with either HP-IB or RS-232-C external controllers.

1-18. The Model 7580B is equipped with such capabilities as point digitizing, labeling, axes generation, and automatic pen selection. Large format, multicolor plots of high resolution and quality in sizes ranging from ANSI A through D or ISO A4 through A1 for reports, reproduction, or graphic presentations are generated by the Model 7580B. Applications include computer aided design (CAD), computer aided manufacturing (CAM), mapping, mechanical and architectural drawings, and general drafting.

1-19. The Model 7580B incorporates a low inertia dc servo motor drive system and optical position feedback for pen positioning and media transport. Internal diagnostic and calibration capabilities are provided as aids for adjustment and troubleshooting procedures.

1-20. Three styles of rotating pen carousels for roller-ball, fiber-tip, and capillary-drafting pens are supplied. Each carousel holds up to eight pens, including different colors and/or line widths. An automatic pen return and capping feature is used in the plotter to increase pen life. If a drafting pen carousel is installed in the plotter, the pen in the pen holder is automatically returned to the carousel stable after 10 seconds if no plotting instructions are detected. If a fiber-tip or roller-ball carousel is installed, the pen is returned after 65 seconds if no plotting instructions are detected. A grooved platen is utilized in the plotter for improved line quality and longer pen life. The plotter will draw on paper, vellum, or double-matte polyester film media. The carousel type is electronically sensed to establish default pen speed, force, and acceleration parameters. Media size is also electronically sensed

to establish plot limits. Default conditions are automatically established for all other plotting parameters. The default parameters can be overridden using front-panel controls or HP-GL programming instructions.

1-21. Plotter firmware contains 77 HP-GL instructions for pen control, arc and circle generation, labeling, rotation, absolute and relative vector plotting, point digitizing, and character sizing, etc. A built-in 18432 byte buffer stores incoming graphic plot instructions which can be invoked by a single instruction. Six resident character sets are provided in two style fonts for either segment or arc generated characters.

1-22. OPTIONS

1-23. Power cord options are listed in Section II of this manual. The power cord configuration shipped with the plotter is dependent upon the country of destination for the plotter.

1-24. The following manual options are available for use with the Model 7580B:

Manual Option No.	Description
051	for use with HP 9000, Series 200 computers
052	for use with HP 9000, Series 100 personal computers
053	for use with HP 3000 computers
058	for use with HP Series 80 personal computers
059	for use with HP 9000, Series 500 computers
060	for use with HP 1000 computers
065	for use with Non-HP computers

1-25. Documentation options are specific user guides for operating the Model 7580B with a particular external controller. Contact your local HP Sales and Support Office for further information on interface and documentation options.

1-26. ACCESSORIES SUPPLIED

1-27. Accessories supplied with the Model 7580B Drafting Plotter are listed in Table 1-3.

1-28. ACCESSORIES AVAILABLE

1-29. Accessories available for use with the Model 7580B Plotter are listed in the HP Computer Users Catalog.

1-30. RECOMMENDED TEST EQUIPMENT AND TOOLS

1-31. Test equipment recommended to maintain the Model 7580B Plotter is listed in Table 1-4. Substitute equipment must meet or exceed the specifications of the equipment recommended.

Table 1-2. Supplemental Characteristics

PLOTTING AREA

Medium Size: Accommodates media from 203×267 mm ($8 \times 10\frac{1}{2}$ in.) to 622×1231.9 mm (24.5×48.5 in.).

Includes standard sizes A4/A through A1/D

Maximum Plotting Area: Medium size less margins

Margin Size:

Expanded Mode: Three margins of 5 mm (+0 mm, -5 mm), fourth margin is 29 mm (+0 mm, -5 mm).

Normal Mode: Three margins of 15 mm (+0 mm, -5 mm), fourth margin is 39 mm (+0 mm, -5 mm).

SPEED

Pen Down:

Maximum: 60 cm/s (24 in./s) independent of vector direction

Programmable: 1 to 60 cm/s (0.4 to 24 in./s) in 1 cm increments

Front Panel Selectable: From 10 to 60 cm/s (4 to 24 in./s) in 10 cm increments

Pen Up:

60 cm/s (24 in./s) independent of vector direction

ACCELERATION

Maximum: 39 m/s^2 (129 ft/s^2)

Programmable: 9.75 to 39 m/s^2 (32 to 128 ft/s^2) (1 to 4 g in 1 g increments)

FORCE

Pen Force: Programmable and front panel selectable: 10 to 66 gram weights in 8 gram increments

PENS

Number of Pens: 8/carousel

Pen Types: Fiber-tip, capillary-drafting, roller-ball

MEDIA

Most standard paper, vellum, and double matte polyester film from 0.05 mm (0.002 in.) to 0.1 mm (0.004 in.) thickness

BUFFER SIZE

18 432 bytes

POWER REQUIREMENTS

Source: 100 V, 120 V, 220 V, 240 V (+5% -10%)

Frequency: 48-66 Hz single phase

Consumption: 182 watts max.

ENVIRONMENTAL RANGE

Operating: Temperature 0°C to 55°C

Relative humidity 5% to 95% (below 40°C)

Non-operating: Temperature -40°C to 75°C

SIZE/WEIGHT

Height: 1188 mm (46.8 in.)

Width: 1087 mm (42.8 in.)

Depth: 557 mm (21.9 in.)

Net weight: 59.0 kg (130 lbs)

Shipping weight: approximately 113.4 kg (250 lbs)

Table 1-3. Accessories Supplied

DESCRIPTION	HP PART NUMBER
HP 7580B/7585B/7586B Interfacing and Programming Manual	07580-90034
HP 7580B/7585B/7586B Operator's Manual	07580-90033
HP 7580B/7585B/7586B Pocket Guide	07580-90035
3 Pen Carousels:	
capillary-drafting pen carousel	07580-60081
roller-ball pen carousel	07580-60082
fiber-tip pen carousel	07580-60035
Pens:	
fiber-tip — package of 5, 0.35 mm, 1 each	17847P
aqua, blue, green, black, violet	
fiber-tip — package of 5, 0.35 mm, 1 each	17849P
yellow, orange, brown, red, red-violet	
roller-ball — package of 4 each	
black	5061-5033
red	5061-5034
green	5061-5035
blue	5061-5036
Supplies Organizer	4040-1953
Digitizing Sight	09872-60066
Drafting Pen Body, Assemblies (Qty 4)	07580-60025
Drafting Pen Tips:	
fine (0.35 mm), 1 each	9260-0588
wide (0.7 mm), 1 each	9260-0579
Drafting Ink, Black (3/4 oz)	9260-0596
Pen Cleaning Solution	9282-0908
Pen Cleaning Syringe	9282-0905
Grit Wheel Brush	8710-1386
Media Sampler	
D (50 sheets ledger, 5 sheets polyester film)	9280-0523
or A1 (50 sheets ledger, 5 sheets polyester film)	9280-0524
Power Cord	As ordered
Male-to-Male RS-232-C/CCITT V.24 Cable	17355M

Table 1-4. Recommended Test Equipment and Tools

INSTRUMENT TYPE	SUGGESTED MODEL
Voltmeter	HP 427A or equivalent
Digital Multimeter	HP 3435A or equivalent
Oscilloscope	HP 182C or equivalent
Vertical Plug-in; Dual Channel Amplifier	HP 1801A
Time Base Plug-in; 10 ns to 1 s	HP 1820C
Logic Probe	HP 10525
Logic Pulser	HP 10526T
Expense Support Package	07580-67801
Inventory Support Package (Exchange PCAs not included)	07580-67901
Digitizing Sight	09872-60066
Tension Gauge (0-700 gm)	8750-0324
Optical Comparator	Bausch and Lomb measuring magnifier No. 81-34-35
Pen Lift Adjustment Tool	07580-60205
Fork Alignment Fixture	07580-60207
Carousel Alignment Fixture	07580-60208
Y-Arm Height Alignment Tool	07585-60300
Y-Arm Parallelism Alignment Tool	07585-60301
HP 85 Service System	N/A
EAROM Reprogramming Tape	5010-2503

SECTION II

PERFORMANCE TESTS

2-1. INTRODUCTION

2-2. This section describes the performance tests that can be used to verify that the essential functions of the plotter are operational and the plotter's performance meets the specifications listed in Section I. If test results indicate a malfunction, refer to the service information in Section VI.

2-3. SAFETY CONSIDERATIONS

2-4. The Safety Symbols used with Hewlett-Packard instruments are illustrated on page v of the front matter of this manual. **WARNING** and **CAUTION** symbols and instructions should be reviewed before service work is performed. These warnings and cautions must be followed for your protection and to avoid damage to the plotter.

2-5. EQUIPMENT REQUIRED

2-6. The only equipment required for the performance tests is an optical comparator, Bausch and Lomb #81-34-35 or equivalent. Substitute equipment must meet or exceed the specifications of the equipment recommended.

2-7. PREPARATION FOR USE

2-8. LINE VOLTAGE AND FUSE SELECTION

2-9. The Model 7580B will operate from a power source of 100, 120, 220, or 240 Vac $\pm 5-10\%$, 48 to 66 Hz, single phase. Power consumption is 182 W maximum. When shipped from the factory, the line voltage selector switches are set and an appropriate fuse installed for operating in the country of destination.

CAUTION

Applying line voltage of 220 or 240 volts to the plotter while the line voltage selector switches are set for 100 or 120 volt operation will cause damage to the plotter circuits.

2-10. The line voltage identification plate visible on the right-hand rear panel indicates the voltage setting. To match the plotter line input circuit to the applied line voltage, perform the following steps:

WARNING

The following service procedures should be performed only by service-trained personnel who are aware of the electrical shock hazard involved.

- a. Set the plotter LINE switch to OFF and disconnect the ac power cord from the plotter.
- b. Remove the rear cover to access the fuse and voltage selector switches on the Power sub-panel.
- c. Position the voltage selector switches to the appropriate line voltage positions. The switches are labeled for 100, 120, 220, or 240 volt operation. See Figure 2-1.
- d. The voltage identification plates are mounted on the Power sub-panel directly above the power cord receptacle. The plates are labeled for 100, 120, 220, or 240 volt operation. Remove the two plate mounting screws to select the appropriate plate. Mount the plates to match the line voltage being used. See Figure 2-1.
- e. Install correct rated fuse and fuseholder cap for the voltage setting (2.5 A for 100, 120 V or 1.6 A for 220, 240 V). See Table 2-1.
- f. Install the rear cover.
- g. Install correct power cord.

Table 2-1. Fuse/Fuseholder Cap Selection

VOLTAGE	100 V/120 V	220 V/240 V
Fuse Rating	2.5 A	1.6 A
Fuse (HP P/N)	2110-0015	2110-0005
Fuseholder Cap (HP P/N)	2110-0565	2110-0565

2-11. POWER CORD CONFIGURATIONS

2-12. The power cord configuration supplied with the plotter is dependent upon the country of destination. Power cord configurations are illustrated in Figure 2-2.

2-13. OPERATING CHARACTERISTICS

2-14. When ON, the plotter is always in one of three mutually exclusive states: NOT-READY, VIEW, or REMOTE. The plotter enters the NOT-READY state upon power up and for media loading or unloading. The VIEW or REMOTE state is entered by pressing the appropriate front-panel pushbutton. State transition to VIEW or REMOTE cannot be invoked programmatically. The VIEW state, however, can be entered programmatically from the REMOTE state by executing the HP-GL instruction, NR. The operational state diagram for the

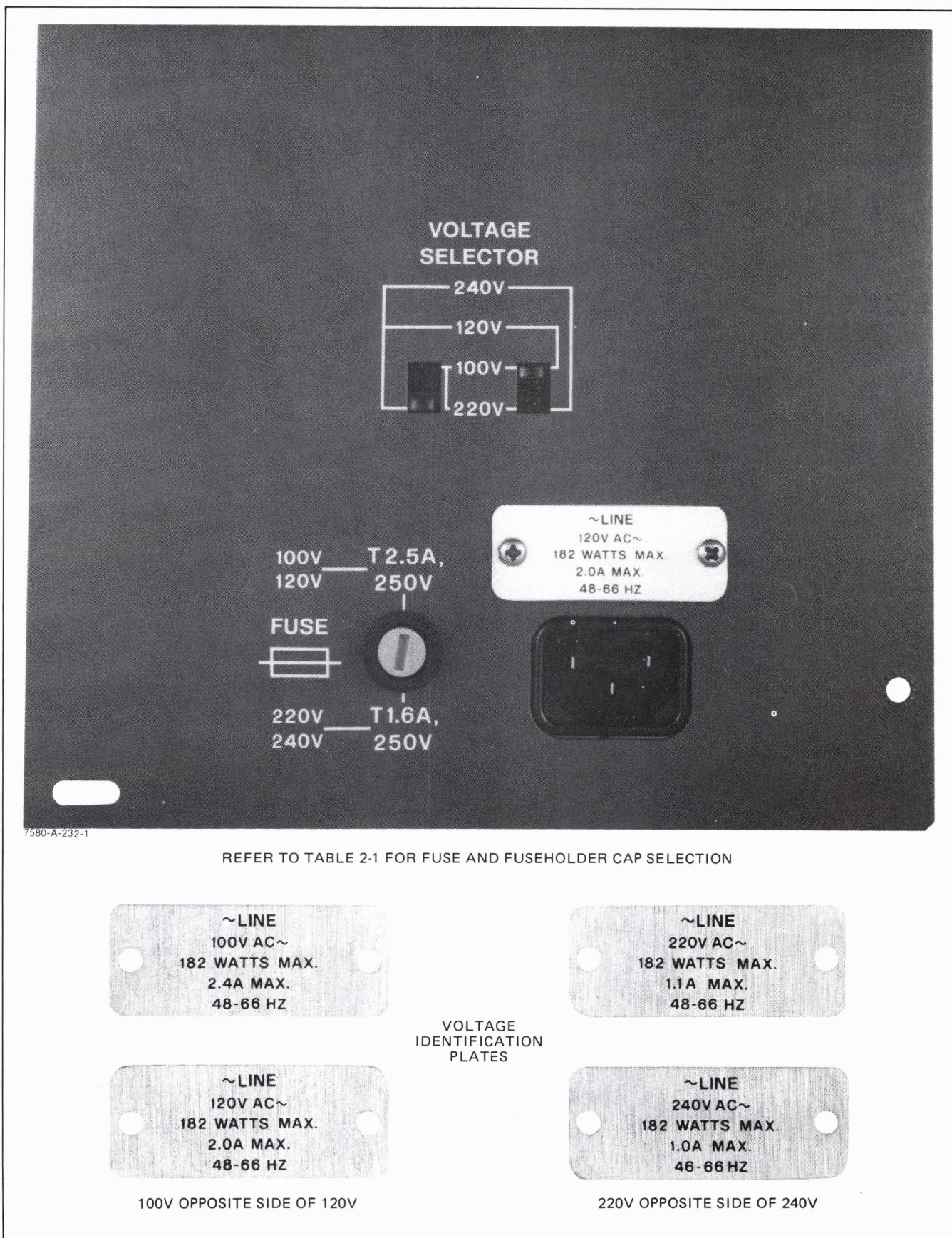
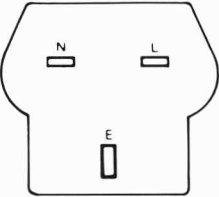
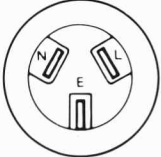
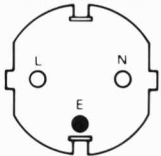


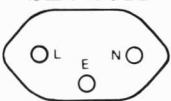
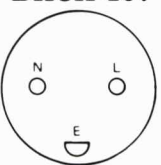
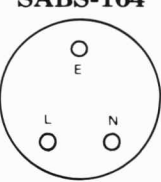


Figure 2-1. Fuse and Voltage Selector Switch Settings (shown in 120 V position with 2.5 A fuse installed)

		<u>Option No.</u>
BS 1363A 	HP Part Number 8120-1351; 250 V, 13 A, 1 ϕ plug rating. For use in United Kingdom, Cyprus, Nigeria, Zimbabwe, Singapore.	900
AS C112 	HP Part Number 8120-1369; 250 V, 10 A, 1 ϕ plug rating. For use in Australia, New Zealand.	901
CEE 7-VII 	HP Part Number 8120-1689; 250 V, 10/16 A, 1 ϕ plug rating. For use in East and West Europe, Egypt.	902
NEMA 5-15P 	HP Part Number 8120-1751; 125 V, 15 A, 1 ϕ plug rating. For use in Canada, Japan, Mexico, Philippines, Taiwan, Saudi Arabia, UL approved in United States.	903
NEMA 6-15P 	HP Part Number 8120-3996; 250 V, 15 A, 1 ϕ plug rating. For use in Canada, UL approved in United States.	904
SEV 1011 	HP Part Number 8120-2104; 250 V, 10 A, 1 ϕ plug rating. For use in Switzerland.	906
DHCK-107 	HP Part Number 8120-2956; 250 V, 10 A, 1 ϕ plug rating. For use in Denmark.	912
SABS-164 	HP Part Number 8120-4211; 250 V, 10 A, 1 ϕ plug rating. For use in India, Republic of South Africa.	917
NOTE: All plugs are viewed from connector end. L = Line or Active Conductor (also called "live" or "hot") N = Neutral or Identified Conductor E = Earth or Safety Ground		

7580-A-209-2

Figure 2-2. Power Cord Configurations

Model 7580B is illustrated in Figure 2-3. The three operational states are defined as follows:

<u>STATE</u>	<u>PLOTTER ACTION</u>
NOT-READY	Data sent to the plotter is of two forms, Device Control Instructions and Graphic Instructions. Control Instructions are acted upon immediately. Graphic (Plot) Instructions are routed to a buffer until they are used in the REMOTE state. Pinch wheels are up and media must be loaded before a state transition can be effected. Graphic parameters are undefined.
VIEW	Plotting action is suspended allowing operator front-panel intervention for media viewing. Graphic position unchanged until front-panel activity changes it. Control Instructions are acted upon immediately. Graphic (Plot) Instructions are routed to a buffer until used in the REMOTE state.
REMOTE	Graphic (Plot) Instructions received through the buffer are processed and plotting action initiated. Control Instructions are acted upon immediately. Data flow is under microprocessor control

2-15. PERFORMANCE TESTS

WARNING

Avoid personal contact with moving media. Long hair or ties and other clothing could get caught on the surface of the media and become entangled in the plotter mechanics resulting in personal injury. Lacerations could also occur due to contact with the edges of the moving media.

2-16. CONFIDENCE TEST

2-17. In order for the user to easily verify that the essential functions of the plotter are operational, an automatic confidence test is built into the plotter. This test can be performed without access to the interior of the plotter. The confidence test can only be performed when the plotter is in the NOT-READY sub-state. Jitter, deadband, retrace, pen lift, and pen to pen repeatability can be checked on the confidence test plot. To perform the confidence test, proceed as follows:

- Remove all interface cables from the plotter.
- Turn the LINE switch ON.
- Load paper into the plotter.
- Either load a pen into the pen holder or load pens into stables 1, 2, and 3 of the pen carousel if a multicolor plot is desired.

- Press the CHART HOLD pushbutton on the front panel.
- Press the CONFIDENCE TEST switch on the rear panel. The plotter will automatically sense the paper edges and begin the confidence test plot shown in Figure 2-4.
- Upon completion of the confidence test, press the CHART UNLOAD pushbutton on the front panel to remove the plot.

2-18. REPEATABILITY

2-19. The following procedure tests the REPEATABILITY of the Model 7580B Plotter using the specification of Table 1-1 as the standard. This test can be performed without access to the interior of the plotter. To verify plotter repeatability, proceed as follows:

- Perform the confidence test described earlier in this section.
- Use an optical comparator and measure the difference between the position of the first set of stars generated in each corner of the plot with the second set of stars drawn over the first set. Repeatability should be within 0.05 mm (0.002 in.). See Figure 2-4.

2-20. OPENING UP THE PLOTTER

2-21. To open up the plotter for access to the self-test controls, refer to Figure 2-5 and perform the following steps:

- Remove the screws mounting the front table brackets to the electronics enclosure.
- Loosen the three front table mounting screws located underneath the top of the table and slide the table out from under the platen.
- Remove the front cover assembly mounting screws and remove the front cover.

2-22. SELF-TEST

2-23. The performance of the Model 7580B can be verified by using a built-in self-test program that is controlled by a set of test selector switches located inside the plotter on the Processor PCA. The printed circuit assemblies in the plotter are identified in Figure 2-6. The self-test is used to prove plotter performance and as an aid in troubleshooting the plotter electronics. In most cases, failures can be isolated to a printed circuit assembly (PCA) level. In some cases, a single test or a combination of tests can be used to isolate problems to a group of components on a PCA. Instructions for setting the self-test switches and interpreting the test results are shown in Figure 2-7.

2-24. SELF-TEST CONTROLS AND INDICATORS

2-25. SELF-TEST SWITCHES

2-26. The self-test switch module (S1), which houses the eight rocker test switches, is located on the Processor

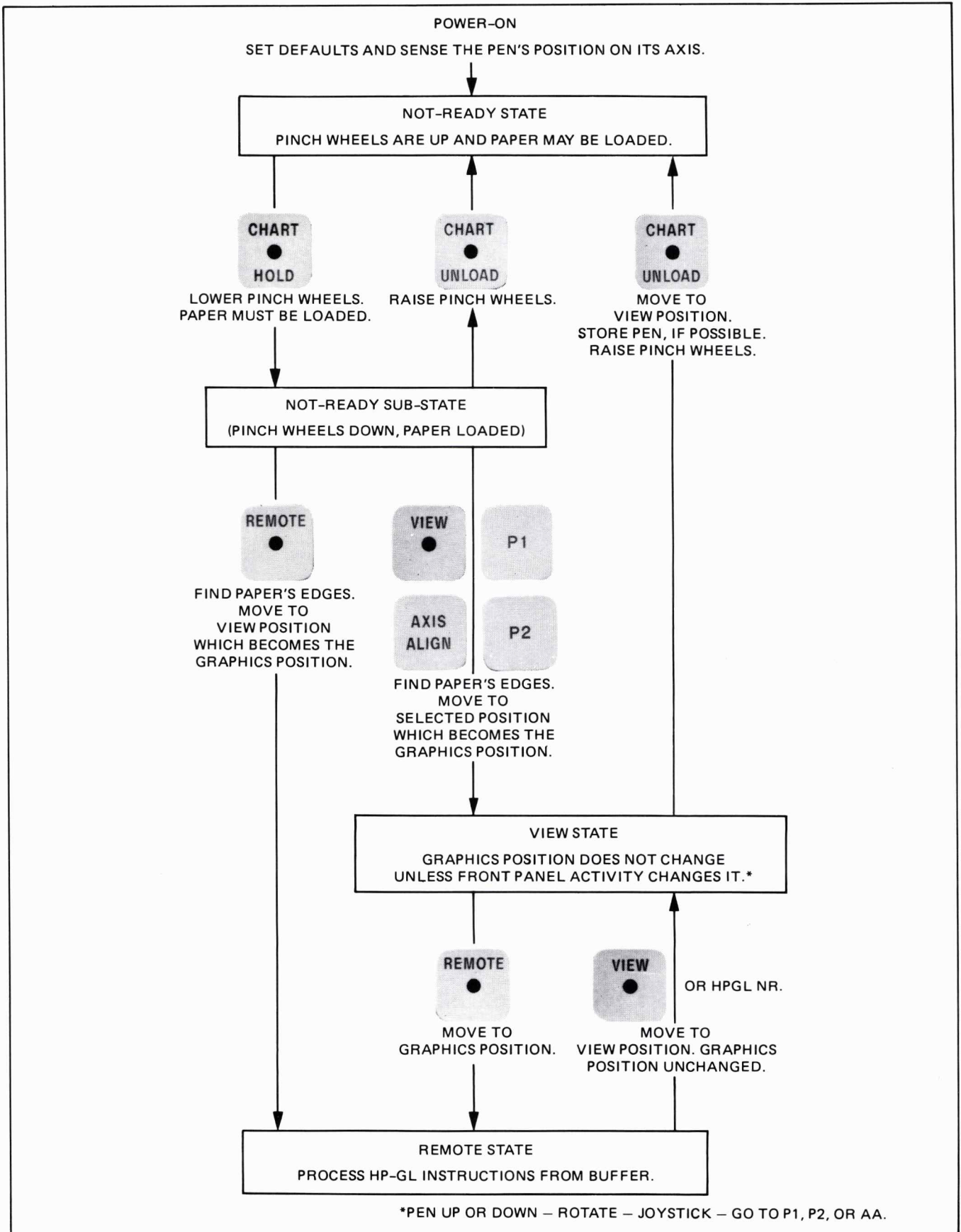


Figure 2-3. Model 7580B State Diagram

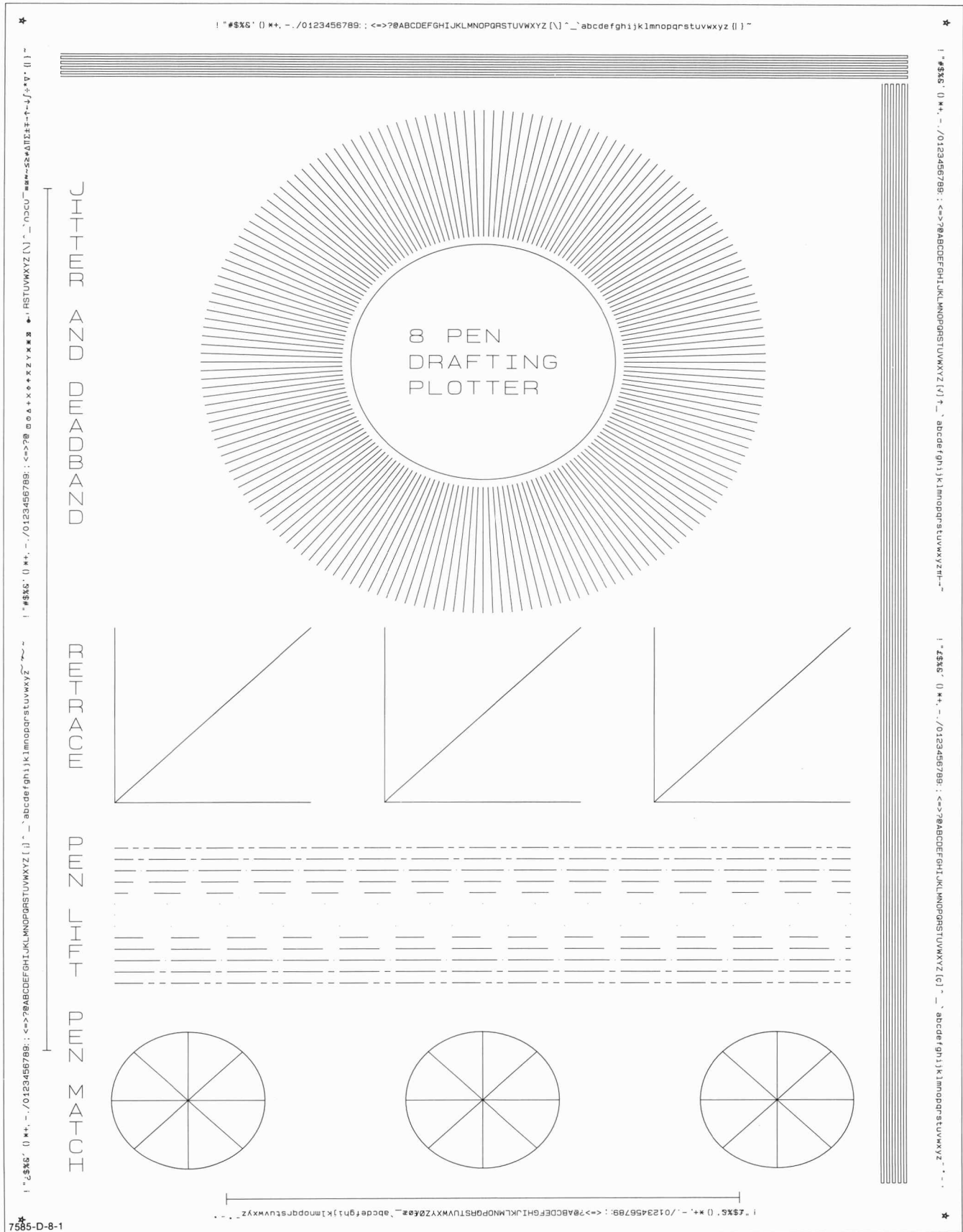
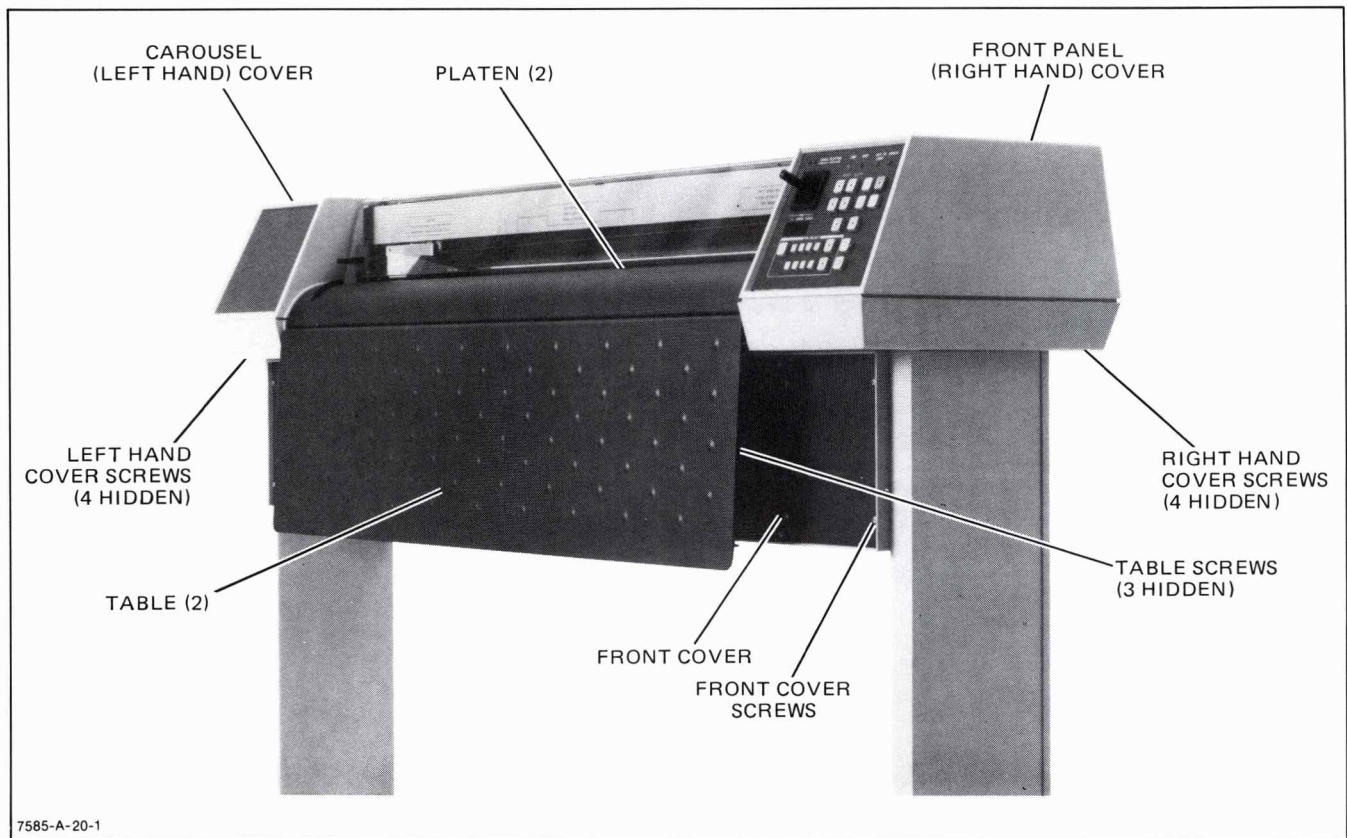


Figure 2-4. Confidence Test Plot



7585-A-20-1

Figure 2-5. Opening up the Plotter

PCA A3. Test switches S1 through S7 are used to select a specific self-test, using binary coding, and are only operational when the plotter is in the self-test mode. Switch S8, the self-test mode switch, sets the plotter for either the self-test mode or for normal operation.

2-27. SELF-TEST INDICATOR

2-28. The self-test indicator is made up of eight light emitting diodes (LEDs) DS1-DS8 located on the Processor PCA A3. Additional self-test indications are shown

in the hexadecimal alphanumeric (A/N) display located on the front panel.

2-29. RESET SWITCH

2-30. The RESET (RST) pushbutton located on the Processor PCA A3 sets the plotter circuits to the same quiescent condition that is established when power is first applied to the plotter. This allows the plotter to be reset without turning the power OFF and then ON again. The RESET button on the Processor PCA can also be used to enter a step in the self-test procedure when the self-test mode switch is in the self-test position (ON).

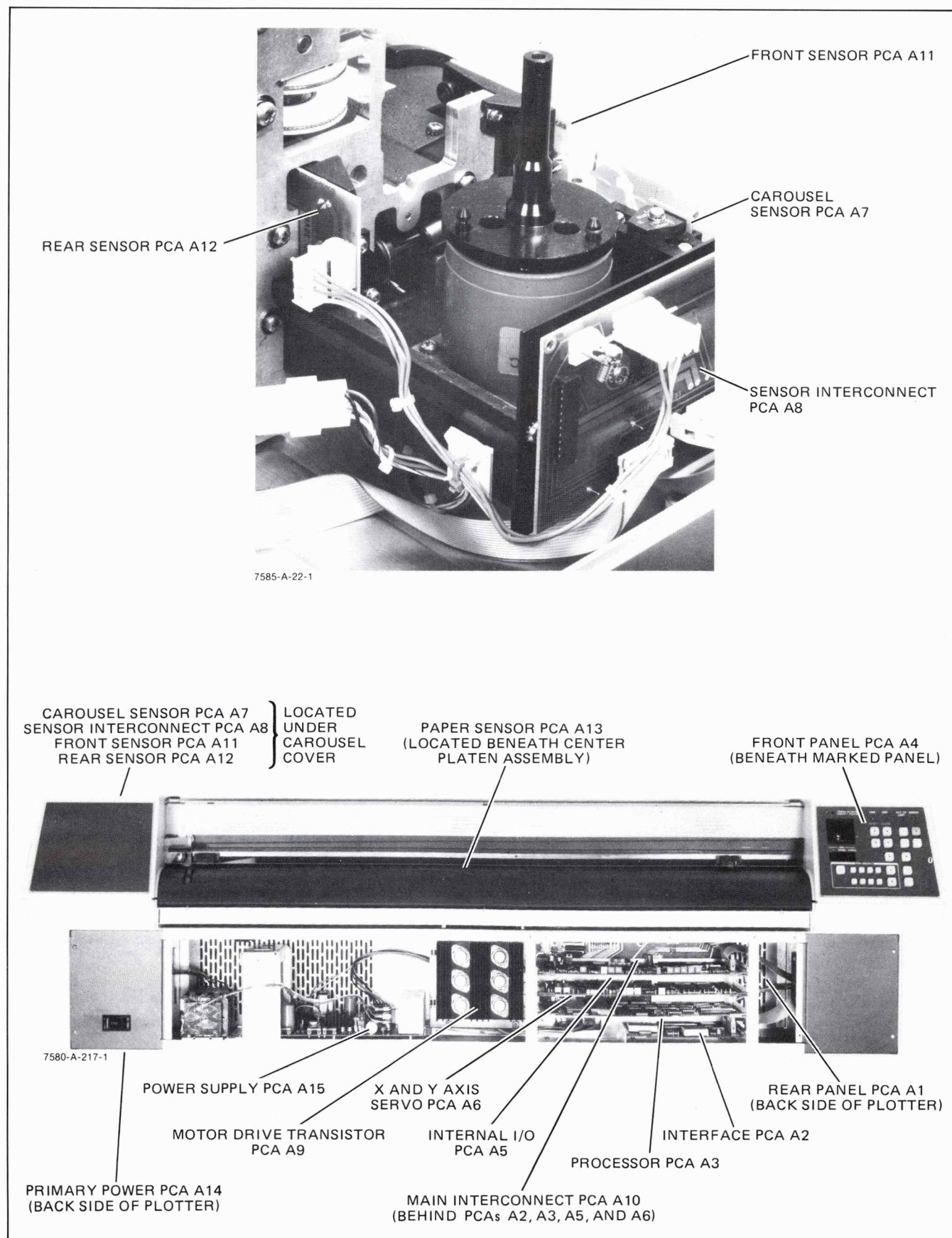


Figure 2-6. Printed Circuit Assembly (PCA) Identification

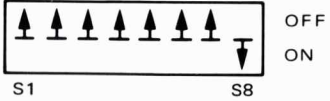






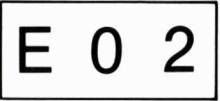















TEST NUMBER	DESCRIPTION OF TEST	OPERATOR ACTION	TEST SWITCHES POSITION	TEST LAMPS ON OFF DONT CARE TOGGLE ON/OFF	A/N DISPLAY	RESULTS AND INTERPRETATIONS
00	TESTS THE PROCESSOR SWITCHES AND LIGHT EMITTING DIODES (LEDs). CONTINUOUSLY COPIES THE CONTENTS OF THE SWITCH REGISTER TO THE LEDs ON THE PROCESSOR PCA.	SET SELF TEST MODE SWITCH S8 TO ON. PUSH THE RESET BUTTON ON THE PROCESOR PCA.	 OFF ON			ALL LAMPS MOMENTARILY LIT, THEN LAMP DS8 AND ALL FRONT PANEL LEDs ARE LIT. A/N DISPLAY IS 000. INDICATES TEST 0 IS GOOD. VERIFIES OPERATION OF THE GENERAL FUNCTIONS OF THE PROCESSOR PCA.
01	COMPUTES THE CHECKSUM OF ALL 48K BYTES OF READ ONLY MEMORY (ROM) ON THE PROCESSOR PCA.	SET SELF TEST MODE SWITCH S8 TO ON. SET TEST SWITCH S1 TO ON. PUSH THE RESET BUTTON ON THE PROCESOR PCA.	 OFF ON	 	 	LAMPS DS1 AND DS8 LIT, THEN ALL LAMPS MOMENTARILY LIT, THEN ALL LAMPS ARE OFF. ALL FRONT PANEL LEDs ARE LIT. A/N DISPLAY IS 000. INDICATES CHECKSUM OF ROM IS ZERO AND TEST 01 IS GOOD. DS2 LIT. A/N DISPLAY IS E02 IF ANY ROM IS DEFECTIVE. ALL FRONT PANEL LEDs EXCEPT ERROR, OUT OF LIMIT, PEN SPEED, AND PEN FORCE ARE LIT. INDICATES ROM CHECKSUM IS NOT ZERO.
02	TESTS THE RANDOM ACCESS MEMORY (RAM) ON THE PROCESSOR PCA.	SET SELF TEST MODE SWITCH S8 TO ON. SET TEST SWITCH S2 TO ON. PUSH THE RESET BUTTON ON THE PROCESOR PCA.	 OFF ON		 	ALL LAMPS MOMENTARILY LIT, THEN ALL LAMPS ARE OFF. ALL FRONT PANEL LEDs ARE LIT. A/N DISPLAY IS 000. INDICATES RAM TEST IS GOOD. A/N DISPLAY IS E01 IF ANY RAM IS DEFECTIVE.
03	TESTS THE FRONT PANEL LIGHT EMITTING DIODES (LEDs). TURNS ALL LEDs AND A/N DISPLAY OFF FOR ONE SECOND. THEN TURNS ALL LEDs ON AND THEN ONE SECOND LATER STARTS DISPLAYING 000 THROUGH FFF IN HEX ON THE A/N DISPLAY AT ONE-HALF SECOND INTERVALS. ALL FRONT PANEL LEDs REMAIN LIT.	SET SELF TEST MODE SWITCH S8 TO ON. SET TEST SWITCHES S1 AND S2 TO ON. PUSH THE RESET BUTTON ON THE PROCESOR PCA.	 OFF ON	    	    	ALL LAMPS MOMENTARILY LIT, THEN LAMPS DS1-DS4 ON THE PROCESSOR PCA COUNT DOWN IN BINARY FROM 15 TO 0, WHILE LAMPS DS5-DS8 REMAIN LIT. WHILE THE PROCESSOR LEDs ARE COUNTING DOWN IN BINARY, THE A/N DISPLAY ON THE FRONT PANEL SIMULTANEOUSLY COUNTS UP IN HEX FROM 000 TO FFF. DISPLAYS CHANGE AT 1/2 SECOND INTERVALS. AT SUCCESSFUL COMPLETION OF TEST, THE PROCESSOR TEST LAMPS DS1-DS4 ARE OFF AND LAMPS DS5-DS8 ARE LIT. THE A/N DISPLAY IS FFF AND ALL FRONT PANEL LEDs ARE LIT.

Figure 2-7. SelfTest (Sheet 1 of 9)

TEST NUMBER	DESCRIPTION OF TEST	OPERATOR ACTION	TEST SWITCHES POSITION	TEST LAMPS ON OFF DON'T CARE TOGGLE ON/OFF	A/N DISPLAY	RESULTS AND INTERPRETATIONS
03 (cont'd)				<div>●</div> <div>○</div> <div>N</div> <div>T</div> <div>①●③●●●●●</div> <div>●②③●●●●●</div> <div>①②③●●●●●</div> <div>●●●④●●●●●</div> <div>①●●④●●●●●</div> <div>●②●④●●●●●</div> <div>①②●④●●●●●</div> <div>●●③④●●●●●</div> <div>①●③④●●●●●</div> <div>●②③④●●●●●</div> <div>①②③④●●●●●</div>	<div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div>	

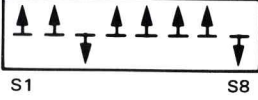

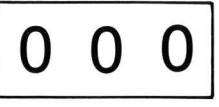


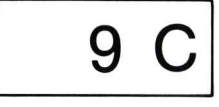


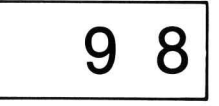
TEST NUMBER	DESCRIPTION OF TEST	OPERATOR ACTION	TEST SWITCHES POSITION	TEST LAMPS ON OFF DON'T CARE TOGGLE ON/OFF	A/N DISPLAY	RESULTS AND INTERPRETATIONS
04	TESTS THE FRONT PANEL PUSHBUTTON SWITCHES AND CIRCUITS. THE PUSHBUTTONS ARE TO BE ACTUATED IN THE SEQUENCE DESCRIBED. CONTINUOUSLY FLASHING LED _s INDICATE A DISRUPTION IN THE PUSHBUTTON SEQUENCE.	SET SELF TEST MODE SWITCH S8 TO ON. SET TEST SWITCH S3 TO ON. PUSH THE RESET BUTTON ON THE PROCESSOR PCA. PRESS AND RELEASE THE FRONT PANEL PUSHBUTTONS IN THE FOLLOWING SEQUENCE. 1. CHART HOLD 2. CHART UNLOAD 3. P1 4. ENTER 5. VIEW 6. REMOTE 7. AXIS ALIGN 8. P2 9. BYPASS 10. ROTATE 11. ALL PENS 12. (PEN SELECT) 1-4 13. PEN SPEED 14. PEN UP 15. (PEN SELECT) 5-8 16. PEN FORCE 17. PEN DOWN	 OFF ON			ALL LAMPS, A/N DISPLAY 000 AND FRONT PANEL LED _s MOMENTARILY LIT. AFTER RELEASING EACH BUTTON, THE OUT OF LIMIT AND ERROR LED _s ON THE FRONT PANEL WILL FLASH MOMENTARILY ON. THE LINE, DSR, CHART HOLD, ENTER, VIEW, ROTATE, PEN SPEED AND PEN FORCE LED _s WILL REMAIN LIT. THE A/N DISPLAY MOMENTARILY FLASHES 000 AND ALL TEST LAMPS MOMENTARILY FLASH ON. IF AN INCORRECT BUTTON IS PUSHED OR THE SEQUENCE DISRUPTED, THE TEST WILL STOP AND THE OUT OF LIMIT, ERROR, CHART UNLOAD, REMOTE, BYPASS, A/N DISPLAY, AND PROCESSOR TEST LAMPS WILL FLASH ON AND OFF CONTINUOUSLY UNTIL THE RESET BUTTON ON THE PROCESSOR IS PRESSED OR THE POWER CYCLED OFF AND ON. ONCE THE SEQUENCE IS DISRUPTED, THE TEST CANNOT RESUME AND SHOULD BE RESTARTED. AT SUCCESSFUL COMPLETION OF TEST, THE LINE, DSR, CHART HOLD, ENTER, VIEW, ROTATE, PEN SPEED AND PEN FORCE LED _s WILL REMAIN LIT.
05	VERIFIES FUNCTION OF THE CARROUSEL INITIALIZATION, PEN INITIALIZATION, PEN IN CARROUSEL, CARROUSEL PRESENT, AND REED SWITCH SENSORS. THE PINCHWHEEL AND PRIMARY CARRIAGE COVER INTERLOCK MICROSWITCHES ARE ALSO TESTED. ALSO SELECTS AND TESTS THE FRONT PAPER SENSOR. THE CONTENTS OF THE ANALOG TO DIGITAL CONVERTER ON THE INTERNAL I/O PCA WILL BE CONTINUOUSLY READ AND DISPLAYED IN HEX ON THE LAST TWO DIGITS OF THE A/N DISPLAY ON THE FRONT PANEL.	SET SELF TEST MODE SWITCH S8 TO ON. SET TEST SWITCHES S1 AND S3 TO ON. PUSH THE RESET BUTTON ON THE PROCESSOR PCA. TO VERIFY THE FUNCTIONS OF THE VARIOUS SENSORS, EACH SENSOR WILL NEED TO BE INDIVIDUALLY DISABLED. THIS WILL CAUSE A CHANGE OF DISPLAY ON BOTH THE TEST LAMPS AND A/N DISPLAY. A PIECE OF PAPER, CREDIT CARD, FINGERTIP OR ANY OTHER NON-TRANSPARENT OBJECT MAY BE USED TO DISRUPT THE LIGHT BEAM OF THE PHOTOTRANSISTOR DEVICES. THE FOLLOWING PROCEDURES MAY BE USED FOR CHECKING THE SENSORS. 1. ROTATE PEN CARROUSEL CLOCKWISE (CW) SLIGHTLY UNTIL REFLECTOR STRIP ON CARROUSEL IS AWAY FROM PHOTOSENSOR. RETURN CARROUSEL TO ORIGINAL POSITION AFTER CHECKING DISPLAY. 2. SLIDE PEN CARRIAGE AWAY FROM INITIALIZATION SENSOR. RETURN PEN CARRIAGE AFTER CHECKING DISPLAY. 3. REMOVE THE PEN WHICH IS CURRENTLY FACING THE PEN CARRIAGE. THIS WILL DISRUPT THE PEN IN CARROUSEL (PEN PRESENT) PHOTSENSOR CIRCUIT. REPLACE PEN AFTER CHECKING DISPLAY.	 OFF ON		   	ALL LAMPS, A/N DISPLAY 000 AND FRONT PANEL LED _s MOMENTARILY LIT. AFTER PRESSING RESET SWITCH ON THE PROCESSOR PCA, THE A/N DISPLAY WILL SHOW IN HEX THE CONTENTS OF THE REGISTER ON THE INTERNAL I/O, TYPICALLY 9C. THE TEST LAMPS DS3, 4, 5, AND 8 WILL BE LIT. DISRUPTING THE CARROUSEL INITIALIZATION PHOTSENSOR SHOULD CAUSE A CHANGE IN TEST LAMP AND A/N DISPLAYS. TYPICALLY A/N DISPLAY IS 9D AND TEST LAMP DS1 IS LIT IN ADDITION TO DS3, 4, 5, AND 8. DISRUPTING THE PEN CARRIAGE INITIALIZATION PHOTSENSOR SHOULD CAUSE A CHANGE IN TEST LAMP AND A/N DISPLAY. TYPICALLY A/N DISPLAY IS 9E AND TEST LAMP DS2 IS LIT IN ADDITION TO DS3, 4, 5, AND 8. DISRUPTING THE PEN IN CARROUSEL PHOTSENSOR SHOULD CAUSE A CHANGE IN TEST LAMP AND A/N DISPLAY. TYPICALLY A/N DISPLAY IS 98 AND TEST LAMP DS3 TURNS OFF LEAVING DS4, 5, AND 8 LIT.

Figure 2-7. Self-Test (Sheet 3 of 9)

TEST NUMBER	DESCRIPTION OF TEST	OPERATOR ACTION	TEST SWITCHES POSITION	TEST LAMPS ON OFF DON'T CARE TOGGLE ON/OFF	A/N DISPLAY	RESULTS AND INTERPRETATIONS
05 (cont'd)		4. REMOVE THE PEN CARROUSEL. THIS WILL DISRUPT THE CARROUSEL PRESENT PHOTO-SENSOR CIRCUIT. REPLACE CARROUSEL AFTER CHECKING DISPLAY.		<div>● ○ N T</div> <div>① ② ③ ④ ● ⑥ ⑦ ●</div>	<div>9 0</div>	DISRUPTING THE CARROUSEL PRESENT PHOTOSENSOR SHOULD CAUSE A CHANGE IN TEST LAMP AND A/N DISPLAY. TYPICALLY A/N DISPLAY IS 90 AND TEST LAMPS DS3 AND 4 TURN OFF LEAVING DS5 AND 8 LIT.
		5. COVER THE FRONT PAPER SENSOR SLOT ON THE PLATEN. UNCOVER SENSOR AFTER CHECKING DISPLAY.		<div>① ② ● ● ⑤ ⑥ ⑦ ●</div>	<div>8 C</div>	DISRUPTING THE FRONT PAPER PHOTO-SENSOR SHOULD CAUSE A CHANGE IN TEST LAMP AND A/N DISPLAY. TYPICALLY A/N DISPLAY IS 8C AND TEST LAMP DS5 TURNS OFF LEAVING DS3, 4, AND 8 LIT.
		6. MANUALLY POSITION PEN CARRIAGE OVER RIGHT HAND PINCHWHEEL UNTIL TEST LAMP AND A/N DISPLAY CHANGE. RETURN PEN CARRIAGE TO INITIALIZATION POSITION AFTER CHECKING DISPLAY.		<div>① ② ● ● ● ● ⑦ ●</div>	<div>B C</div>	ACTIVATING THE PINCHWHEEL REED SWITCH SHOULD CAUSE A CHANGE IN TEST LAMP AND A/N DISPLAY. TYPICALLY A/N DISPLAY IS BC AND TEST LAMP DS6 IS LIT IN ADDITION TO DS3, 4, 5, AND 8.
		7. RAISE THE CARRIAGE COVER TO THE OPEN POSITION. THIS WILL CHECK OPERATION OF THE PRIMARY CARRIAGE COVER INTER-LOCK MICROSWITCH. CLOSE COVER AFTER CHECKING DISPLAY.		<div>① ② ● ● ● ⑥ ⑦ ⑧</div>	<div>1 C</div>	ACTIVATING THE PRIMARY CARRIAGE COVER INTERLOCK MICROSWITCH SHOULD CAUSE A CHANGE IN TEST LAMP AND A/N DISPLAY. TYPICALLY A/N DISPLAY IS 1C AND TEST LAMP DS8 TURNS OFF LEAVING DS3, 4, AND 5 LIT.
		8. MANUALLY ROTATE THE PINCHWHEEL CAM-SHAFT OR CLOSE THE PINCHWHEEL CAM MICROSWITCH UNTIL THE TEST LAMP AND A/N DISPLAY CHANGE. RETURN TO ORIGINAL POSITION AFTER CHECKING DISPLAY.		<div>① ② ● ● ● ⑥ ● ●</div>	<div>D C</div>	ACTIVATING THE PINCHWHEEL MICROSWITCH SHOULD CAUSE A CHANGE IN TEST LAMP AND A/N DISPLAY. TYPICALLY A/N DISPLAY IS DC AND TEST LAMP DS7 IS LIT IN ADDITION TO DS3, 4, 5, AND 8.
06	IDENTICAL TO SELF TEST 05 EXCEPT THAT THE REAR PAPER SENSOR IS SELECTED AND TESTED INSTEAD OF THE FRONT PAPER SENSOR, AND THE SUPPLEMENTARY CARRIAGE COVER MICROSWITCH IS TESTED AS WELL AS THE PRIMARY MICROSWITCH.	SET SELF TEST MODE SWITCH S8 TO ON. SET SELF TEST SWITCHES S2 AND S3 TO ON. PUSH THE RESET BUTTON ON THE PROCESSOR PCA. TO VERIFY THE FUNCTIONS OF THE VARIOUS PEN AND CARROUSEL SENSORS, DUPLICATE THE OPERATOR ACTIONS DESCRIBED IN TEST 05. 1. TO TEST THE REAR PAPER SENSOR, COVER THE REAR PAPER SENSOR SLOT ON THE PLATEN. CHECK THE DISPLAYS AND UNCOVER THE SENSOR. 2. RAISE THE CARRIAGE COVER TO THE OPEN POSITION. THE PRIMARY AND SUPPLEMENTARY CARRIAGE COVER INTERLOCK MICROSWITCHES ARE TESTED. CLOSE COVER AFTER CHECKING DISPLAY.	<div>S1 S8</div> <div>OFF ON</div>	<div>① ② ● ● ● ⑥ ⑦ ●</div> <div>① ② ● ● ⑤ ⑥ ⑦ ●</div> <div>① ② ● ● ● ⑥ ● ⑧</div>	<div>9 C</div> <div>8 C</div> <div>1 C</div>	ALL LAMPS, A/N DISPLAY 000, AND FRONT PANEL LEDs MOMENTARILY LIT. AFTER PRESSING THE RESET BUTTON ON THE PROCESSOR PCA, THE A/N DISPLAY WILL SHOW IN HEX THE CONTENTS OF THE REGISTER/ON THE INTERNAL I/O, TYPICALLY 9C. TEST LAMPS DS3, 4, 5, AND 8 WILL BE LIT. DISRUPTING THE REAR PAPER PHOTOSENSOR SHOULD CAUSE A CHANGE IN THE TEST LAMP AND A/N DISPLAY. TYPICALLY A/N DISPLAY IS 8C AND TEST LAMP DS5 TURNS OFF LEAVING DS3, 4, AND 8 LIT. ACTIVATING THE CARRIAGE COVER INTERLOCK MICROSWITCHES SHOULD CAUSE A CHANGE IN TEST LAMP AND A/N DISPLAY. TYPICALLY A/N DISPLAY IS 1C. TEST LAMP DS7 TURNS ON INDICATING PROPER OPERATION OF THE SUPPLEMENTARY MICROSWITCH AND TEST LAMP DS8 TURNS OFF INDICATING PROPER OPERATION OF THE PRIMARY MICROSWITCH. TEST LAMPS DS3, 4, AND 5 REMAIN LIT.

Figure 2-7. Self-Test (Sheet 4 of 9)






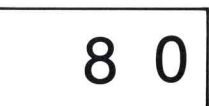
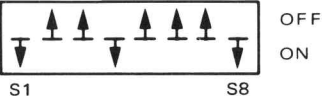

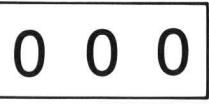


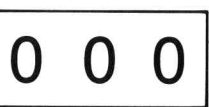


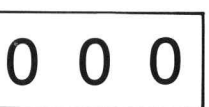
TEST NUMBER	DESCRIPTION OF TEST	OPERATOR ACTION	TEST SWITCHES POSITION	TEST LAMPS ON OFF DON'T CARE TOGGLE ON/OFF	A/N DISPLAY	RESULTS AND INTERPRETATIONS
07	DETERMINES THE MEDIA TRANSPORT (X) AXIS POSITION OF THE JOYSTICK. THE CONTENTS OF THE ANALOG TO DIGITAL CONVERTER ON THE INTERNAL I/O PCA WILL BE CONTINUOUSLY READ AND DISPLAYED IN HEX ON THE LAST TWO DIGITS OF THE A/N DISPLAY ON THE FRONT PANEL. THE DISPLAY SHOULD BE APPROXIMATELY 80 IN HEX WHEN JOYSTICK IS NOT TOUCHED. THIS POSITION TESTED IS THE NULL POSITION OF THE JOYSTICK WHEN REFERENCING THE MEDIA TRANSPORT (X) AXIS.	SET SELF TEST MODE SWITCH S8 TO ON. SET TEST SWITCHES S1, S2, AND S3 TO ON. PUSH THE RESET BUTTON ON THE PROCESSOR PCA.	 OFF ON			ALL LAMPS, A/N DISPLAY 000, AND FRONT PANEL LEDs MOMENTARILY LIT. AFTER PRESSING THE RESET BUTTON ON THE PROCESSOR PCA, THE A/N DISPLAY WILL SHOW IN HEX THE CONTENTS OF THE ADC ON THE INTERNAL I/O, IDEALLY 80. TYPICALLY THE A/N DISPLAY WILL ONLY APPROXIMATE 80. A SLIGHT PRESSURE ON THE JOYSTICK SHOULD RESULT IN THE IDEAL DISPLAY. THE TEST LAMPS SHOULD SHOW DS8 LIT, IDEALLY, ALTHOUGH TYPICALLY DS1-DS8 MAY FLICKER WHEN THE A/N DISPLAY IS NOT 80.
08	IDENTICAL TO SELF TEST 07 EXCEPT THAT THE PEN CARRIAGE (Y) AXIS POSITION OF JOYSTICK IS DETERMINED AND REFERENCED FROM NULL.	SET SELF TEST MODE SWITCH S8 TO ON. SET TEST SWITCH S4 TO ON. PUSH THE RESET BUTTON ON THE PROCESSOR PCA.	 OFF ON			RESULTS AND INTERPRETATIONS ARE THE SAME AS IN TEST 07 EXCEPT THAT THE TRUE NULL POSITION DISPLAYED IN HEX FOR THE PEN CARRIAGE (Y) AXIS MAY NOT NECESSARILY DUPLICATE THE NULL DISPLAY IN HEX FOR THE MEDIA TRANSPORT (X) AXIS.
09	TESTS OPERATION OF THE PINCHWHEELS BY REVERSING CURRENT POSITION FROM UP TO DOWN OR DOWN TO UP.	SET SELF TEST MODE SWITCH S8 TO ON. SET TEST SWITCHES S1 AND S4 TO ON. PUSH THE RESET BUTTON ON THE PROCESSOR PCA.	 OFF ON			TEST LAMPS MOMENTARILY LIT THEN ALL OFF. A/N DISPLAY 000 AND FRONT PANEL LEDs REMAIN LIT. PINCHWHEELS SHOULD REVERSE CURRENT POSITION FROM UP TO DOWN OR DOWN TO UP WHEN RESET BUTTON ON PROCESSOR IS RELEASED.
10	VERIFIES OPERATION OF THE PEN CARROUSEL MOTOR AND CIRCUITRY BY ROTATING THE CARROUSEL THREE COMPLETE REVOLUTIONS.	SET SELF TEST MODE SWITCH S8 TO ON. SET TEST SWITCHES S2 AND S4 TO ON. PUSH THE RESET BUTTON ON THE PROCESSOR PCA.	 OFF ON			TEST LAMPS MOMENTARILY LIT THEN ALL OFF. A/N DISPLAY 000 AND FRONT PANEL LEDs REMAIN LIT. PEN CARROUSEL SHOULD ROTATE THREE COMPLETE REVOLUTIONS.
11	VERIFIES ZERO OUTPUT TO THE MEDIA TRANSPORT (X) AXIS AND PEN CARRIAGE (Y) AXIS OF THE DIGITAL TO ANALOG CONVERTER ON THE X AND Y AXIS SERVO PCA WHEN NO INPUTS ARE PRESENT.	SET SELF TEST MODE SWITCH S8 TO ON. SET TEST SWITCHES S1, S2, AND S4 TO ON. TURN SERVO MOTOR MUTE SWITCHES S2 AND S3 TO THE OFF POSITION. TURN TEST SWITCH S1 ON SERVO PCA TO "TEST" POSITION. PUSH THE RESET BUTTON ON THE PROCESSOR PCA. USING SMALL RAPID MOVEMENTS, MANUALLY MOVE EITHER THE PEN CARRIAGE OR GRIT WHEEL BACK AND FORTH. TEST BOTH AXES. IN BOTH CASES, THE MOVEMENT SHOULD CAUSE A TOGGLE ON/OFF EFFECT ON LAMPS B AND C LOCATED ON THE X AND Y AXIS SERVO PCA. TURN SERVO MOTOR MUTE SWITCHES TO ON AND TEST SWITCH S1 TO NORMAL POSITION.	 OFF ON			TEST LAMPS MOMENTARILY LIT THEN ALL OFF. A/N DISPLAY 000 AND FRONT PANEL LEDs REMAIN LIT. BACK AND FORTH MOVEMENT OF THE PEN CARRIAGE SHOULD CAUSE LAMPS B AND C ON THE X AND Y AXIS SERVO PCA TO TOGGLE ON AND OFF. SIMILAR MOVEMENT ON THE GRIT WHEEL WILL CAUSE THE SAME EFFECT. LAMPS B AND C OFF INDICATE NO INPUT PRESENT. LAMPS B AND C ON INDICATE PRESENCE OF INPUT AS WHEN MOTION OF ONE OF THE AXES IS DETECTED. THIS TEST IS PRIMARILY DESIGNED AND USED IN THE ELECTRICAL ADJUSTMENTS OF THE X AND Y AXIS SERVO PCA DESCRIBED IN SECTION 3 OF THIS MANUAL.

Figure 2-7. Self-Test (Sheet 5 of 9)

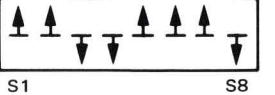


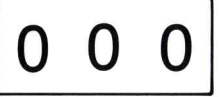
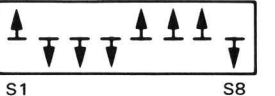

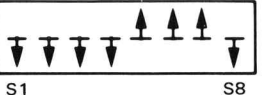
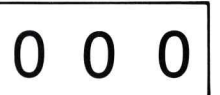
TEST NUMBER	DESCRIPTION OF TEST	OPERATOR ACTION	TEST SWITCHES POSITION	TEST LAMPS ON OFF DON'T CARE TOGGLE ON/OFF	A/N DISPLAY	RESULTS AND INTERPRETATIONS
12	VERIFIES INPUT TO THE MEDIA TRANSPORT (X) AXIS BY INPUTTING A 10 BIT RAMP OF POSITIONAL DATA TO THE DIGITAL TO ANALOG CONVERTER ON THE X AND Y AXIS SERVO PCA.	SET SELF TEST MODE SWITCH S8 TO ON. SET TEST SWITCHES S3 AND S4 TO ON. TURN SERVO MOTOR MUTE SWITCHES S2 AND S3 TO THE OFF POSITION. TURN TEST SWITCH S1 ON SERVO PCA TO "TEST" POSITION. PUSH THE RESET BUTTON ON THE PROCESOR PCA. TURN SERVO MOTOR MUTE SWITCHES TO ON AND TEST SWITCH S1 TO NORMAL POSITION.	 OFF ON	① ② ③ ④ ⑤ ⑥ ⑦ ⑧		TEST LAMPS MOMENTARILY LIT THEN ALL OFF. A/N DISPLAY 000 AND FRONT PANEL LEDs REMAIN LIT. LAMPS B AND C ON THE X AND Y AXIS SERVO PCA SHOULD TOGGLE ON AND OFF AUTOMATICALLY INDICATING PRESENCE OF THE 10 BIT RAMP OF POSITIONAL DATA TO THE X AXIS POSITION INPUT OF THE DAC ON THE X AND Y AXIS SERVO PCA.
13	VERIFIES INPUT TO THE PEN CARRIAGE (Y) AXIS BY INPUTTING A 10 BIT RAMP OF POSITIONAL DATA TO THE DIGITAL TO ANALOG CONVERTER ON THE X AND Y AXIS SERVO PCA.	SET SELF TEST MODE SWITCH S8 TO ON. SET TEST SWITCHES S1, S3, AND S4 TO ON. TURN SERVO MOTOR MUTE SWITCHES S2 AND S3 TO THE OFF POSITION. TURN TEST SWITCH S1 ON SERVO PCA TO "TEST" POSITION. PUSH THE RESET BUTTON ON THE PROCESOR PCA. TURN SERVO MOTOR MUTE SWITCHES TO ON AND TEST SWITCH S1 TO NORMAL POSITION.	 OFF ON	① ② ③ ④ ⑤ ⑥ ⑦ ⑧		TEST LAMPS MOMENTARILY LIT THEN ALL OFF. A/N DISPLAY 000 AND FRONT PANEL LEDs REMAIN LIT. LAMPS B AND C ON THE X AND Y AXIS SERVO PCA SHOULD TOGGLE ON AND OFF AUTOMATICALLY INDICATING PRESENCE OF THE 10 BIT RAMP OF POSITIONAL DATA TO THE Y AXIS POSITION INPUT OF THE DAC ON THE X AND Y AXIS SERVO PCA.
14	VERIFIES INPUT OF MEDIA TRANSPORT (X) AXIS VELOCITY DATA TO THE DIGITAL TO ANALOG CONVERTER ON THE X AND Y AXIS SERVO PCA. DATA IS INPUT AT 1 ms INTERVALS.	SET SELF TEST MODE SWITCH S8 TO ON. SET TEST SWITCHES S2, S3, AND S4 TO ON. PUSH THE RESET BUTTON ON THE PROCESOR PCA. TURN SERVO MOTOR MUTE SWITCHES S2 AND S3 TO THE OFF POSITION. TURN TEST SWITCH S1 ON SERVO PCA TO "TEST" POSITION. USING SMALL RAPID MOVEMENTS, MOVE THE GRIT WHEEL BACK AND FORTH. TURN SERVO MOTOR MUTE SWITCHES TO ON AND TEST SWITCH S1 TO "NORMAL" POSITION.	 OFF ON	① ② ③ ④ ⑤ ⑥ ⑦ ⑧		TEST LAMPS MOMENTARILY LIT THEN ALL OFF. A/N DISPLAY 000 AND FRONT PANEL LEDs REMAIN LIT. LAMPS B AND C ON THE X AND Y AXIS SERVO PCA SHOULD TOGGLE ON AND OFF AS MOVEMENT OF THE GRIT WHEEL IS DETECTED. THE LAMPS ARE LIT DURING MOVEMENT INDICATING PRESENCE OF INPUT TO THE X AXIS VELOCITY INPUT OF THE DAC ON THE X AND Y AXIS SERVO PCA.
15	VERIFIES INPUT OF PEN CARRIAGE (Y) AXIS VELOCITY DATA TO THE DIGITAL TO ANALOG CONVERTER ON THE X AND Y AXIS SERVO PCA. DATA IS INPUT AT 1 ms INTERVALS.	SET SELF TEST MODE SWITCH S8 TO ON. SET TEST SWITCHES S1, S2, S3, AND S4 TO ON. PUSH THE RESET BUTTON ON THE PROCESOR PCA. TURN SERVO MOTOR MUTE SWITCHES S2 AND S3 TO THE OFF POSITION. TURN TEST SWITCH S1 ON SERVO PCA TO "TEST" POSITION. USING SMALL RAPID MOVEMENTS, MOVE THE PEN CARRIAGE BACK AND FORTH. TURN SERVO MOTOR MUTE SWITCHES TO ON AND TEST SWITCH S1 TO "NORMAL" POSITION.	 OFF ON	① ② ③ ④ ⑤ ⑥ ⑦ ⑧		TEST LAMPS MOMENTARILY LIT THEN ALL OFF. A/N DISPLAY 000 AND FRONT PANEL LEDs REMAIN LIT. LAMPS B AND C ON THE X AND Y AXIS SERVO PCA SHOULD TOGGLE ON AND OFF AS MOVEMENT OF THE PEN CARRIAGE IS DETECTED. THE LAMPS ARE LIT DURING MOVEMENT INDICATING PRESENCE OF INPUT TO THE Y AXIS VELOCITY INPUT OF THE DAC ON THE X AND Y AXIS SERVO PCA.

Figure 2-7. Self-Test (Sheet 6 of 9)

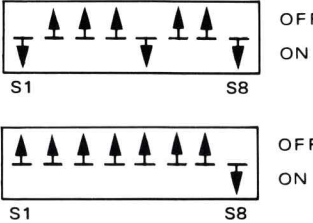
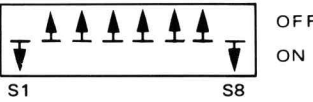
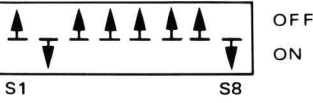
TEST NUMBER	DESCRIPTION OF TEST	OPERATOR ACTION	TEST SWITCHES POSITION	TEST LAMPS ON OFF DON'T CARE TOGGLE ON/OFF	A/N DISPLAY	RESULTS AND INTERPRETATIONS
17	<p>TESTS THE REAR PANEL PCA A1. TESTS THE SWITCH ARRAYS AND INTERFACE MODE LEDS.</p> <p>AFTER ENTERING SELF TEST 17, THE TEST SWITCHES WILL BE SET TO DIFFERENT POSITIONS IN ORDER TO SELECT AND TEST THE VARIOUS SWITCHES IN THE SWITCH ARRAYS.</p> <p>SINCE THE SETTINGS OF THE VARIOUS REAR PANEL SWITCHES WILL CAUSE NUMEROUS AND DIFFERENT TEST LAMP INDICATIONS, ONLY THE TEST LAMPS IMMEDIATELY INVOLVED IN THE INDIVIDUAL TESTS WILL BE DISCUSSED. THE REMAINING TEST LAMPS WILL BE DESIGNATED AS "DON'T CARE" (N).</p>	<p>SET THE SELF TEST MODE SWITCH S8 TO ON. SET TEST SWITCHES S1 AND S5 TO ON. PUSH THE RESET BUTTON ON THE PROCESSOR PCA.</p> <p>LEAVE TEST MODE SWITCH S8 ON AND TURN TEST SWITCHES S1 AND S5 TO OFF. PROCEED AS FOLLOWS:</p> <ol style="list-style-type: none">1. SET INTERFACE MODE SELECT SWITCH ON THE REAR PANEL TO THE HP-IB POSITION. OBSERVE TEST LAMPS.2. SET INTERFACE MODE SELECT SWITCH TO THE RS-232-C POSITION AND OBSERVE THE TEST LAMPS.	<p></p> <p></p> <p></p>	<p>① ② ③ ④ ⑤ ⑥ ⑦ ⑧</p> <p>① ● (N) (N) (N) (N) (N) (N)</p> <p>● ② (N) (N) (N) (N) (N) (N)</p> <p>(N) (N) (N) (N) ● (N) (N) (N)</p> <p>(N) (N) ● (N) (N) (N) (N) (N)</p> <p>(N) ● (N) (N) (N) (N) (N) (N)</p> <p>● (N) (N) (N) (N) (N) (N) (N)</p> <p>(N) (N) (N) (N) (N) ● (N) (N)</p> <p>(N) (N) (N) (N) ● (N) (N) (N)</p> <p>(N) (N) ● (N) (N) (N) (N) (N)</p> <p>(N) ● (N) (N) (N) (N) (N) (N)</p> <p>● (N) (N) (N) (N) (N) (N) (N)</p>	<p>0 0 0</p>	<p>A/N DISPLAY 000 AND ALL FRONT PANEL LEDS REMAIN LIT. ALL TEST LAMPS MOMENTARILY LIT. AFTER RELEASING THE RESET BUTTON ON THE PROCESSOR PCA, THE TEST LAMP INDICATIONS WILL VARY ACCORDING TO THE SETTING OF THE VARIOUS REAR PANEL SWITCHES. ONLY THE TEST LAMPS INVOLVED IN THE SPECIFIC TEST WILL BE DISCUSSED. THE REMAINING LAMPS WILL BE DESIGNATED BY N (DON'T CARE).</p> <p>TEST LAMP DS2 SHOULD BE ON WHEN IN THE HP-IB POSITION.</p> <p>TEST LAMP DS1 SHOULD BE ON WHEN IN THE RS-232-C POSITION.</p> <p>TEST LAMP DS5 SHOULD BE ON IN THE EXPAND POSITION, OFF IN THE NORMAL POSITION.</p> <p>TEST LAMP DS4 SHOULD BE ON IN THE EMULATE POSITION, OFF IN THE NORMAL POSITION.</p> <p>TEST LAMP DS3 SHOULD BE ON IN THE STAND ALONE POSITION, OFF IN THE EAVESDROP POSITION.</p> <p>TEST LAMP DS2 SHOULD BE ON IN THE MONITOR MODE POSITION, OFF IN THE NORMAL POSITION.</p> <p>TEST LAMP DS1 SHOULD BE ON IN THE LOCAL POSITION, OFF IN THE NORMAL POSITION.</p> <p>THE HP-IB INTERFACE MODE LED INDICATOR ON THE REAR PANEL SHOULD TURN ON.</p> <p>TEST LAMP DS6 SHOULD BE ON IN THE LISTEN ONLY POSITION, OFF IN THE NORMAL POSITION.</p> <p>TEST LAMP DS5 SHOULD BE ON WHEN A1 IS IN THE 1 POSITION. OFF WHEN IN THE 0 POSITION.</p> <p>TEST LAMP DS4 SHOULD BE ON WHEN A2 IS IN THE 1 POSITION, OFF WHEN IN THE 0 POSITION.</p> <p>TEST LAMP DS3 SHOULD BE ON WHEN A3 IS IN THE 1 POSITION, OFF WHEN IN THE 0 POSITION.</p> <p>TEST LAMP DS2 SHOULD BE ON WHEN A4 IS IN THE 1 POSITION, OFF WHEN IN THE 0 POSITION.</p> <p>TEST LAMP DS1 SHOULD BE ON WHEN A5 IS IN THE 1 POSITION, OFF WHEN IN THE 0 POSITION.</p>
	TEST PLOTTER SYSTEM SWITCH ARRAY.	SET TEST SWITCH S1 TO ON. <ol style="list-style-type: none">1. SET THE EXPAND/NORMAL SWITCH TO THE EXPAND POSITION AND OBSERVE THE TEST LAMPS.2. SET THE EMULATE/NORMAL SWITCH TO THE EMULATE POSITION AND OBSERVE THE TEST LAMPS.3. SET THE STAND ALONE/EAVESDROP SWITCH TO THE STAND ALONE POSITION; OBSERVE TEST LAMPS. SET TO EAVESDROP; OBSERVE TEST LAMPS.4. SET THE MONITOR MODE/NORMAL SWITCH TO THE MONITOR MODE POSITION; OBSERVE TEST LAMPS.5. SET THE LOCAL/NORMAL SWITCH TO THE LOCAL POSITION AND OBSERVE THE TEST LAMPS.				
	TEST HP-IB SWITCH ARRAY.	SET TEST SWITCH S1 TO OFF AND S2 TO ON. <ol style="list-style-type: none">1. SET THE LISTEN ONLY/NORMAL SWITCH TO THE LISTEN ONLY POSITION AND OBSERVE THE TEST LAMPS.2. SET THE HP-IB ADDRESS SWITCH A1 TO THE 1 (ON) POSITION AND OBSERVE THE TEST LAMPS.3. SET THE HP-IB ADDRESS SWITCH A2 TO THE 1 (ON) POSITION AND OBSERVE THE TEST LAMPS.4. SET THE HP-IB ADDRESS SWITCH A3 TO THE 1 (ON) POSITION AND OBSERVE THE TEST LAMPS.5. SET THE HP-IB ADDRESS SWITCH A4 TO THE 1 (ON) POSITION AND OBSERVE THE TEST LAMPS.6. SET THE HP-IB ADDRESS SWITCH A5 TO THE 1 (ON) POSITION AND OBSERVE THE TEST LAMPS.				

Figure 2-7. Self-Test (Sheet 7 of 9)

Figure 2-7. Self-Test (Sheet 8 of 9)

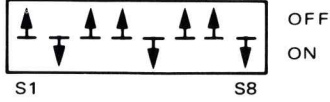
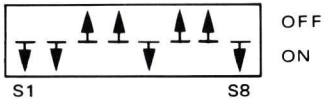
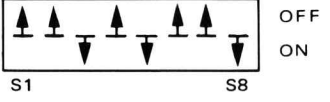
TEST NUMBER	DESCRIPTION OF TEST	OPERATOR ACTION	TEST SWITCHES POSITION	TEST LAMPS ON OFF DON'T CARE TOGGLE ON/OFF	A/N DISPLAY	RESULTS AND INTERPRETATIONS
18	PERFORMS A CHECKSUM OF THE ELECTRICALLY ALTERABLE READ ONLY MEMORY (EAROM) LOCATED ON THE INTERNAL I/O PCA A5. CHECKS SUM LOCATIONS 1 THROUGH 62.	SET SELF TEST MODE SWITCH S8 TO ON. SET TEST SWITCHES S2 AND S5 TO ON. PUSH THE RESET BUTTON ON THE PROCESSOR PCA.		① ② ③ ④ ⑤ ⑥ ⑦ ⑧	<div>0 0 0</div> <div>E 0 6</div>	TEST LAMPS MOMENTARILY LIT THEN ALL OFF. ALL FRONT PANEL LEDS EXCEPT CHART HOLD REMAIN LIT. A/N DISPLAY IS 000. INDICATES TEST 18 IS GOOD. A/N DISPLAY IS E06 IF EAROM CHECKSUM IS DEFECTIVE.
19	TESTS THE HP-IB GENERAL PURPOSE INTERFACE BUS (GPIB) ADAPTOR CIRCUITRY ON THE INTERFACE PCA A2.	SET SELF TEST MODE SWITCH S8 TO ON. SET TEST SWITCHES S1, S2, AND S5 TO ON. PUSH THE RESET BUTTON ON THE PROCESSOR PCA.		Ⓣ Ⓣ Ⓣ Ⓣ Ⓣ Ⓣ Ⓣ Ⓣ	<div>0 0 0</div> <div>E 0 1</div>	TEST LAMPS AND ALL FRONT PANEL LEDs MOMENTARILY ON. THEN ALL TEST LAMPS AND THE FRONT PANEL OUT OF LIMITS, ERROR, CHART UNLOAD, REMOTE, BYPASS, AND A/N DISPLAY CONTINUOUSLY TOGGLE ON AND OFF. A/N DISPLAY IS 000. REMAINING FRONT PANEL LEDs REMAIN ON STEADY. A/N DISPLAY IS E01 AND LEDs DO NOT TOGGLE ON AND OFF IF THE GPIB ADAPTOR IS DEFECTIVE.
20	TESTS THE RS-232-C DUAL ASYNCHRONOUS RECEIVER/TRANSMITTER (DART) CIRCUITRY ON THE INTERFACE PCA A2.	CONNECT THE MALE-TO-MALE RS-232-C CABLE TO THE MODEM AND TERMINAL CONNECTORS ON THE BACK PANEL. SET SELF TEST MODE SWITCH S8 TO ON. SET TEST SWITCHES S3 AND S5 TO ON. PUSH THE RESET BUTTON ON THE PROCESSOR PCA.		Ⓣ Ⓣ Ⓣ Ⓣ Ⓣ Ⓣ Ⓣ Ⓣ	<div>0 0 0</div> <div>E 0 1</div>	TEST LAMPS AND ALL FRONT PANEL LEDs MOMENTARILY ON. THEN ALL TEST LAMPS AND FRONT PANEL OUT OF LIMITS, ERROR, CHART UNLOAD, REMOTE, BYPASS, AND A/N DISPLAY CONTINUOUSLY TOGGLE ON AND OFF. A/N DISPLAY IS 000. REMAINING FRONT PANEL LEDs REMAIN ON STEADY. A/N DISPLAY IS E01 AND LEDs DO NOT TOGGLE ON AND OFF IF THE DART IS DEFECTIVE.

Figure 2-7. Self-Test (Sheet 9 of 9)

SECTION III

ADJUSTMENTS

3-1. INTRODUCTION

3-2. This section describes adjustments and checks used to maintain the Model 7580B Plotter, or to return the plotter to proper operating condition after repairs have been made.

3-3. Since certain adjustments may rely upon the prior completion of other adjustments, it is recommended that adjustment procedures be performed in the sequence specified.

3-4. SAFETY CONSIDERATIONS

3-5. The Model 7580B Drafting Plotter has been designed in accordance with accepted safety standards. Safety symbols used with Hewlett-Packard instruments are illustrated on page v of the front matter in this manual. These symbols should be reviewed before service work is performed.

WARNING

The following service procedures should be performed only by service-trained personnel who are aware of the electrical shock hazards involved.

Certain adjustments described in this section are performed with power applied to the plotter with protective covers removed. Voltage available at many points may, if contacted, result in personal injury.

Any adjustment, maintenance, or repair of the opened plotter with voltage applied should be carried out only by a skilled person who is aware of the hazard involved.

WARNING

Avoid personal contact with moving media. Long hair or ties and other clothing can get caught on the surface of the media and become entangled in the plotter mechanics resulting in personal injury. Lacerations can also occur due to contact with the edges of the moving media.

3-6. EQUIPMENT REQUIRED

3-7. The Recommended Test Equipment table in Section I lists the equipment required for adjustments. For

ease of reference, this list is duplicated in Table 3-1. Substitute equipment must meet or exceed the specifications of the equipment recommended.

3-8. OPENING UP THE PLOTTER

3-9. To open up the plotter for access to the self-test controls and the electrical adjustments, refer to Figure 3-1 and perform the following steps:

- a. Remove the screws mounting the front table brackets to the electronics enclosure.
- b. Loosen the three front table mounting screws located underneath the top of the table and slide the table out from under the platen.
- c. Remove the front cover assembly mounting screws and remove the front cover.

3-10. To open the plotter for access to the mechanical adjustments, refer to Figure 3-1 and perform the following steps to remove cabinet parts as required:

- a. To remove the carousel (left hand) cover assembly, remove the four mounting screws accessible from the bottom of the cover.
- b. To remove the front panel (right hand) cover assembly, remove the four mounting screws accessible from the bottom of the cover. Disconnect the Front Panel PCA ribbon cable and supplementary carriage cover microswitch connector if necessary.
- c. To remove the front and/or rear table(s), remove the screws mounting the front and/or rear table brackets to the electronics enclosure. Loosen the three mounting screws accessible from beneath each table and slide the table(s) away from the plotter.
- d. To remove the front and/or rear cover(s), remove the corresponding table(s) and remove the mounting screws from the cover.
- e. To remove the carriage cover, remove the carousel and front-panel covers and remove the four carriage cover mounting screws (two at each end). Disconnect the interlock microswitch wires from the Sensor Interconnect PCA A8.
- f. To remove the front and/or rear platen(s), remove the carousel and front-panel covers and remove the front and/or rear table(s) as necessary. Remove the carriage cover for access to the rear platen mounting screws, slide platen(s) away from plotter.

Table 3-1. Recommended Test Equipment and Tools

INSTRUMENT TYPE	SUGGESTED MODEL
Voltmeter	HP 427A or equivalent
Digital Multimeter	HP 3435A or equivalent
Oscilloscope	HP 182C or equivalent
Vertical Plug-in; Dual Channel Amplifier	HP 1801A
Time Base Plug-in; 10 ns to 1 s	HP 1820C
Logic Probe	HP 10525T
Logic Pulser	HP 10526T
Expense Support Package	07580-67801
Inventory Support Package (Exchange PCAs not included)	07580-67901
Digitizing Sight	09872-60066
Tension Gauge (0-700 gm)	8750-0324
Optical Comparator	Bausch and Lomb measuring magnifier No. 81-34-35
Pen Lift Adjustment Tool	07580-60205
Fork Alignment Fixture	07580-60207
Carousel Alignment Fixture	07580-60208
Y-Arm Height Alignment Tool	07585-60300
Y-Arm Parallelism Alignment Tool	07585-60301
HP 85 Service System	N/A
EAROM Reprogramming Tape	5010-2503

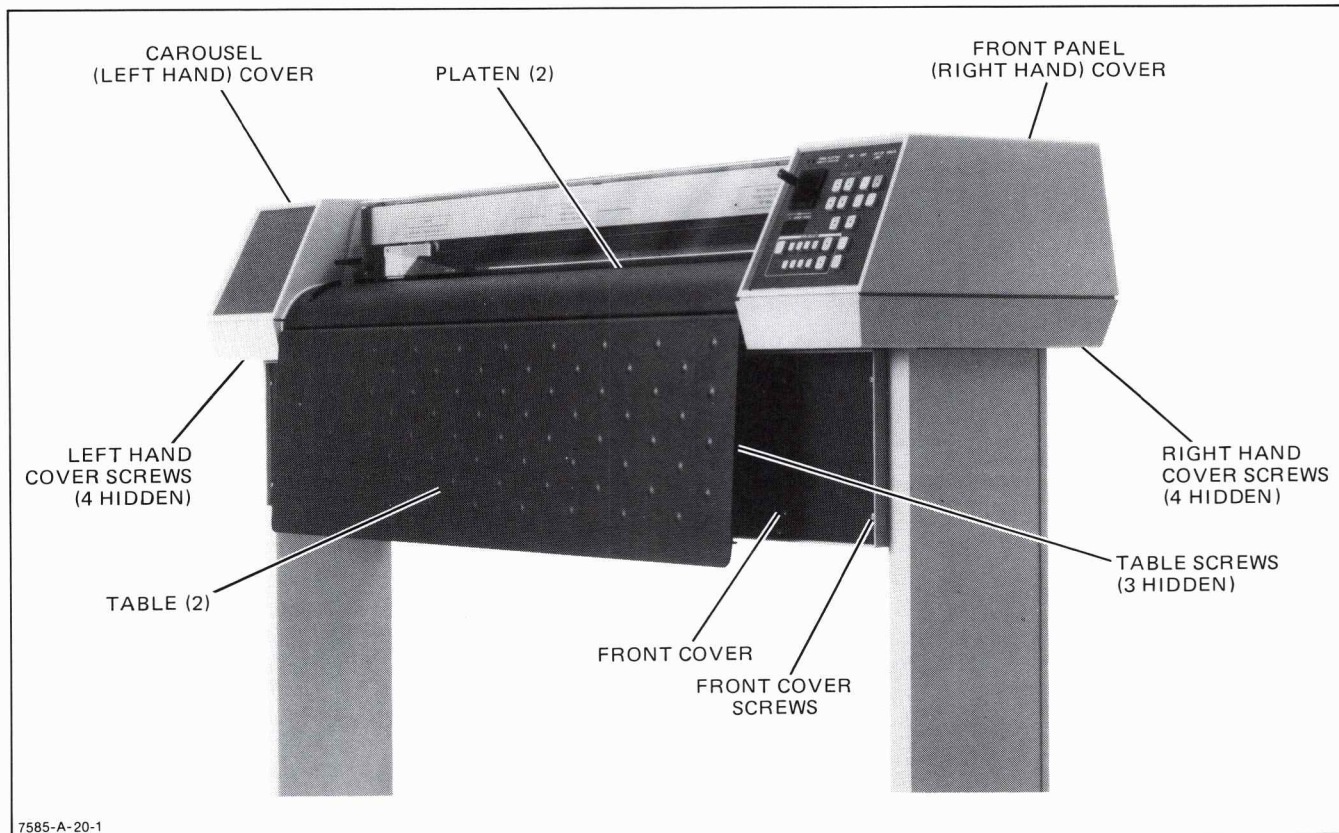


Figure 3-1. Opening up the Plotter

- g. To remove the pen holder cover, remove the two mounting screws and lift cover from the pen holder assembly.

3-11. CALIBRATION TEST

3-12. A built-in calibration test using the self-test controls and confidence test switch is provided and may be used as an aid in checking the operation of some of the mechanisms and associated circuits prior to and during adjustments. See Figure 3-2 for description and interpretation of the calibration test procedures.

3-13. ADJUSTMENT AND TEST POINT DEFINITIONS

3-14. The adjustments and test points used in this manual are referenced by their mnemonic designators. For technical references, these mnemonic designators and their definitions are listed in Table 3-2. Refer to Figure 3-3 and the Service Sheets in Section VI for the locations of the various adjustments and test points.

3-15. ELECTRICAL ADJUSTMENTS

3-16. The locations of the electrical adjustment points in the Model 7580B Plotter are shown in Figure 3-3. Location of the various test points referenced in the electrical adjustment procedures are also shown in Figure 3-3.

3-17. A quick reference guide for the electrical adjustments covered in this section is given in Table 3-3.

3-18. POWER SUPPLY +5 VOLT ADJUSTMENT

3-19. To adjust the +5 volt supply for the plotter electronics, perform the following steps:

- a. Turn the plotter OFF. Remove the front table and front cover. If necessary, refer to the procedure on Opening up the Plotter given in this section.
- b. Connect multimeter between the +5 V and ACOM test points on the X- and Y-Axis Servo PCA A6.
- c. Turn the plotter ON.
- d. Adjust the +5 V adjustment potentiometer R20 on the Power Supply PCA A15 for a reading of +5.00 volts (± 0.05 volts).

3-20. PEN CARRIAGE INITIALIZATION ADJUSTMENT

3-21. Pen carriage initialization is adjusted by performing the following steps:

- a. Turn the plotter OFF. Remove the front table and front cover. If necessary, refer to the procedure on Opening up the Plotter given in this section.
- b. Disconnect the X- and Y-Axis Servo PCA A6 from the Main Interconnect PCA A10.

- c. Set oscilloscope to dc input, 0.1 volt/division vertical sensitivity (using a 10:1 probe), 0.2 millisecond/division horizontal sweep.

- d. Connect oscilloscope probe between test point #4 (TP4) and test point #19 (TP19) on the Internal I/O PCA A5.

- e. Turn the plotter ON.

- f. Adjust the PEN INITIALIZATION potentiometer R99 on the Internal I/O PCA A5 for a 2 volt peak pulse waveform on the scope. See Figure 3-4. If no waveform is present, manually position the pen carriage away from its initialization position sensor and then adjust.

- g. Reconnect the Servo PCA.

3-22. PEN CAROUSEL INITIALIZATION ADJUSTMENT

3-23. Perform the pen carousel initialization adjustment as follows:

- a. Turn the plotter OFF. Remove the front table and front cover. If necessary, refer to the procedure on Opening up the Plotter given in this section.

- b. Disconnect the X- and Y-Axis Servo PCA A6 from the Main Interconnect PCA A10.

- c. Set oscilloscope to dc input, 0.1 volt/division vertical sensitivity (using a 10:1 probe), 0.2 millisecond/division horizontal sweep.

- d. Connect oscilloscope probe between test point #8 (TP8) and test point #19 (TP19) on the Internal I/O PCA A5.

- e. Turn the plotter ON.

- f. Manually rotate the pen carousel so as to position the pen carousel initialization reflector strip (the large foil strip on the pen carousel) in front of the pen carousel initialization sensor. The scope should display a 1.5 kHz 6% duty cycle pulse waveform.

- g. Adjust the CAROUSEL INITIALIZATION potentiometer R101 on the Internal I/O PCA A5 for a 2 volt peak pulse waveform on the scope.

- h. Reconnect the Servo PCA.

3-24. PEN LIFT ADJUSTMENT

3-25. To adjust the pen lift, perform the following steps:

- a. Turn the plotter OFF. remove the front table and front cover. If necessary, refer to the procedure on Opening up the Plotter given in this section.

- b. Turn the servo motor switches S2 and S3 on the X- and Y-Axis Servo PCA A6 to the OFF position.

- c. Turn the plotter ON.

- d. If an E28 error code does not occur on power up, manually move the pen carriage arm until the relay on the Main Interconnect PCA A10 opens. An audible click signals opening the relay.
- e. Adjust the PEN POSITION GAIN adjustment potentiometer R112 on the Internal I/O PCA A5 fully clockwise (CW).
- f. Connect multimeter between test point #13 (TP13) and test point #19 (TP19) on the Internal I/O PCA A5.
- g. Remove the pen from the pen holder if installed.
- h. Adjust the PEN POSITION adjustment potentiometer R108 on the Internal I/O PCA A5 for a reading of 0.00 volts (± 0.10 volts).
- i. Manually press the pen holder down, avoiding any lateral movement. Adjust the PEN POSITION GAIN adjustment potentiometer R112 on the Internal I/O PCA A5 for a reading of +6.00 volts (± 0.10 volts). Release the pen holder.
- j. Steps h. and i. above are interactive. Repeat steps h. and i. until the interaction is eliminated and both readings are within tolerance.
- k. Manually press the pen holder down, avoiding any lateral movement. Adjust the PEN POSITION adjustment potentiometer R108 on the Internal I/O PCA A5 for a reading of +5.60 volts (± 0.05 volts).
- l. Adjust the SPRING COMPENSATION adjustment potentiometer R105 on the Internal I/O PCA A5 fully counterclockwise (CCW).
- m. Turn the plotter OFF.
- n. Turn the servo motor switches S2 and S3 on the X- and Y-Axis Servo PCA A6 to the ON position.
- o. Turn the plotter ON.
- p. Load a sheet of paper onto the plotter.
- q. Invoke the plotter into the VIEW state by pressing the VIEW pushbutton on the front panel.
- r. Set the pen force on all pens to 1 by pressing the following front-panel pushbuttons in the sequence given.
 1. PEN FORCE
 2. ALL PENS
 3. PEN SELECT 1
 4. ENTER
- s. Raise and lower the pen holder a few times by pressing the PEN UP and PEN DOWN pushbuttons on the front panel. Leave the pen holder in the pen up position.
- t. Set the multimeter to the 0.3 V scale.
- u. Set pen lift adjustment tool (HP P/N 07580-60205) into the pen holder.
- v. Adjust the FORCE BIAS adjustment potentiometer R109 on the Internal I/O PCA A5 for a reading of +0.150 volts (± 0.005 volts).
- w. Remove the pen lift adjustment tool from the pen holder.
- x. Adjust the PEN FORCE adjustment potentiometer R106 on the Internal I/O PCA A5 for a reading of 0.000 volts (± 0.005 volts).
- y. Steps v. and x. above are interactive. Repeat steps u. through x. until the interaction is eliminated and both readings are within tolerance.
- z. Lower the pen holder by pressing the PEN DOWN pushbutton on the front panel.
- aa. Adjust the SPRING COMPENSATION adjustment potentiometer R105 on the Internal I/O PCA A5 fully clockwise (CW).
- ab. Manually press the pen holder down.
- ac. Adjust the SPRING COMPENSATION adjustment potentiometer R105 on the Internal I/O PCA A5 counterclockwise (CCW) until the pen holder remains stationary at the point you manually position it to.
- ad. Press the PEN UP pushbutton on the front panel.
- ae. Set the multimeter to the 0.1 V scale.
- af. Adjust the FORCE BIAS adjustment potentiometer R109 on the Internal I/O PCA A5 for a reading of +0.080 volts (± 0.005 volts).
- ag. Set oscilloscope to dc input, 0.2 volt/division vertical sensitivity (using a 10:1 probe), 20 millisecond/division horizontal sweep.
- ah. Connect oscilloscope probe between test point #13 (TP13) and test point #19 (TP19) on the Internal I/O PCA A5.
- ai. Select Calibration Test 0 (zero) as described in the Calibration Test procedure in this section.
- aj. Adjust the PEN DAMPING potentiometer R107 on the Internal I/O PCA A5 for a 40 millisecond rise time on the waveform as shown in Figure 3-5.

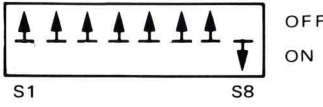
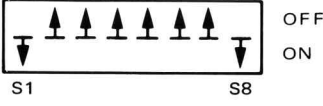

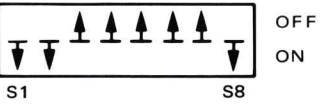
TEST NUMBER	DESCRIPTION OF TEST	OPERATOR ACTION	TEST SWITCHES POSITION	PURPOSE
0	CYCLES THE PEN LIFT CIRCUIT THROUGH THE UP/DOWN STATES EVERY 50 MS. OUTPUTS TO THE PEN LIFT MECHANISM AND THE A/N DISPLAY TOGGLE BETWEEN 00 AND 09 EVERY 50 MS CAUSING THE PENHOLDER TO TOGGLE UP AND DOWN.	SET THE SELF TEST MODE SWITCH S8 ON THE PROCESSOR PCA TO ON PUSH THE CONFIDENCE TEST SWITCH ON THE REAR PANEL PCA TURN ALL SELF TEST SWITCHES OFF AND PUSH THE RESET BUTTON AT THE COMPLETION OF THE TEST	 OFF ON	CHECKS THE OPERATION OF THE PEN LIFT MECHANISM AND ASSOCIATED CIRCUITRY.
1	SAME AS CALIBRATION TEST 0 ABOVE, EXCEPT FRONT PANEL INTERVENTION IS REQUIRED TO TOGGLE THE PEN LIFT MECHANISM BETWEEN OUTPUTS	SET THE SELF TEST MODE SWITCH S8 ON THE PROCESSOR PCA TO ON SET TEST SWITCH S1 ON THE PROCESSOR PCA TO ON PRESS THE CONFIDENCE TEST SWITCH ON THE REAR PANEL PCA PRESS ANY FRONT PANEL PUSHBUTTON. THE PENHOLDER SHOULD TOGGLE FROM THE UP STATE TO THE DOWN STATE. PRESSING ANY FRONT PANEL PUSHBUTTON WILL NOW CAUSE THE PENHOLDER TO TOGGLE FROM THE DOWN STATE TO THE UP STATE. TURN ALL SELF TEST SWITCHES OFF AND PUSH THE RESET BUTTON AT THE COMPLETION OF THE TEST	 OFF ON	CHECKS THE OPERATION OF THE PEN LIFT MECHANISM AND ASSOCIATED CIRCUITRY. MANUAL INTERVENTION ALLOWS CHECKING OF PEN LIFT MECHANICS
2	PROVIDES A MANUAL STEP-BY-STEP PEN PICKING PROCEDURE. FRONT PANEL INTERVENTION IS REQUIRED TO ADVANCE THE PEN PICK THROUGH EACH STEP. THE PEN PICKING SEQUENCE TEST CONSISTS OF ROTATING THE PEN CARROUSEL TO THE PEN #1 POSITION, MOVING THE PENHOLDER TO THE 'HAVE-PEN' POSITION, ADVANCING THE PENHOLDER INTO THE CARROUSEL, AND REVERSING THE PENHOLDER OUT OF THE CARROUSEL.	SET THE SELF TEST MODE SWITCH S8 ON THE PROCESSOR PCA TO ON SET TEST SWITCH S2 ON THE PROCESSOR PCA TO ON PUSH THE CONFIDENCE TEST SWITCH ON THE REAR PANEL PCA PRESS ANY FRONT PANEL PUSHBUTTON TO ADVANCE THE TEST TO THE NEXT STEP. TWO OR THREE PRESSES OF THE SWITCHES MAY BE NECESSARY BEFORE ACTION IS TAKEN. THE TEST SEQUENCE CONSISTS OF THE FOLLOWING STEPS: 1) PEN CARROUSEL ROTATES TO PEN #1 SELECT POSITION 2) PENHOLDER MOVED INTO THE 'HAVE-PEN' POSITION 3) PENHOLDER ADVANCED INTO THE PEN CARROUSEL FOR PEN PICK 4) PENHOLDER REVERSED OUT OF PEN CARROUSEL WITH PEN IN HOLDER CONTINUAL PRESSING OF FRONT PANEL PUSHBUTTON WILL CAUSE THE SEQUENCE TO BE REPEATED EXCEPT FOR STEP 1 TURN ALL SELF TEST SWITCHES OFF AND PUSH THE RESET BUTTON AT THE COMPLETION OF THE TEST	 OFF ON	CHECKS PENHOLDER AND PEN PICKING OPERATION. MANUAL INTERVENTION PROVIDES A STEP-BY-STEP CHECK OF THE PEN PICKING SEQUENCE INCLUDING PROPER SEATING OF THE PEN CAPS. PEN CARROUSEL HEIGHT, PENHOLDER OPERATION, PEN PICKING PROCEDURE, AND PEN CAPPING MAY BE CHECKED USING THIS TEST.
3	PROVIDES MANUAL STEPPING OF THE PEN CARROUSEL FOR CARROUSEL INITIALIZATION SENSOR CALIBRATION. FRONT PANEL INTERVENTION IS REQUIRED TO SEQUENCE THE PROCEDURE THROUGH EACH STEP. THE SEQUENCE CONSISTS OF INITIALIZING THE CARROUSEL, POSITIONING THE CARROUSEL BETWEEN PEN SELECT STALL #5 AND STALL #6, ROTATING THE CARROUSEL TO THE INITIALIZATION SENSOR POSITION FOR CALIBRATION (PEN STALL #3), AND ROTATING BACK TO POSITION BETWEEN STALL #5 AND STALL #6.	SET THE SELF TEST MODE SWITCH S8 ON THE PROCESSOR PCA TO ON SET TEST SWITCHES S1 AND S2 ON THE PROCESSOR PCA TO ON PRESS THE CONFIDENCE TEST SWITCH ON THE REAR PANEL PCA PRESS ANY FRONT PANEL PUSHBUTTON TO ADVANCE TO THE NEXT STEP. SEVERAL PRESSES OF THE BUTTON MAY BE NECESSARY BEFORE ACTION IS TAKEN THE SEQUENCE CONSISTS OF THE STEPS GIVEN IN THE DESCRIPTION OF THE TEST TURN ALL SELF TEST SWITCHES OFF AND PUSH THE RESET BUTTON AT THE COMPLETION OF THE TEST	 OFF ON	CHECKS THE PEN CARROUSEL INITIALIZATION POSITION MANUAL INTERVENTION OF THE SEQUENCE ALLOWS CALIBRATION OF THE INITIALIZATION STRIP IN REFERENCE TO THE PEN CARROUSEL INITIALIZATION SENSOR.

Figure 3-2. Calibration Test
(Sheet 1 of 2)

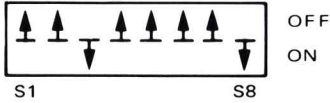

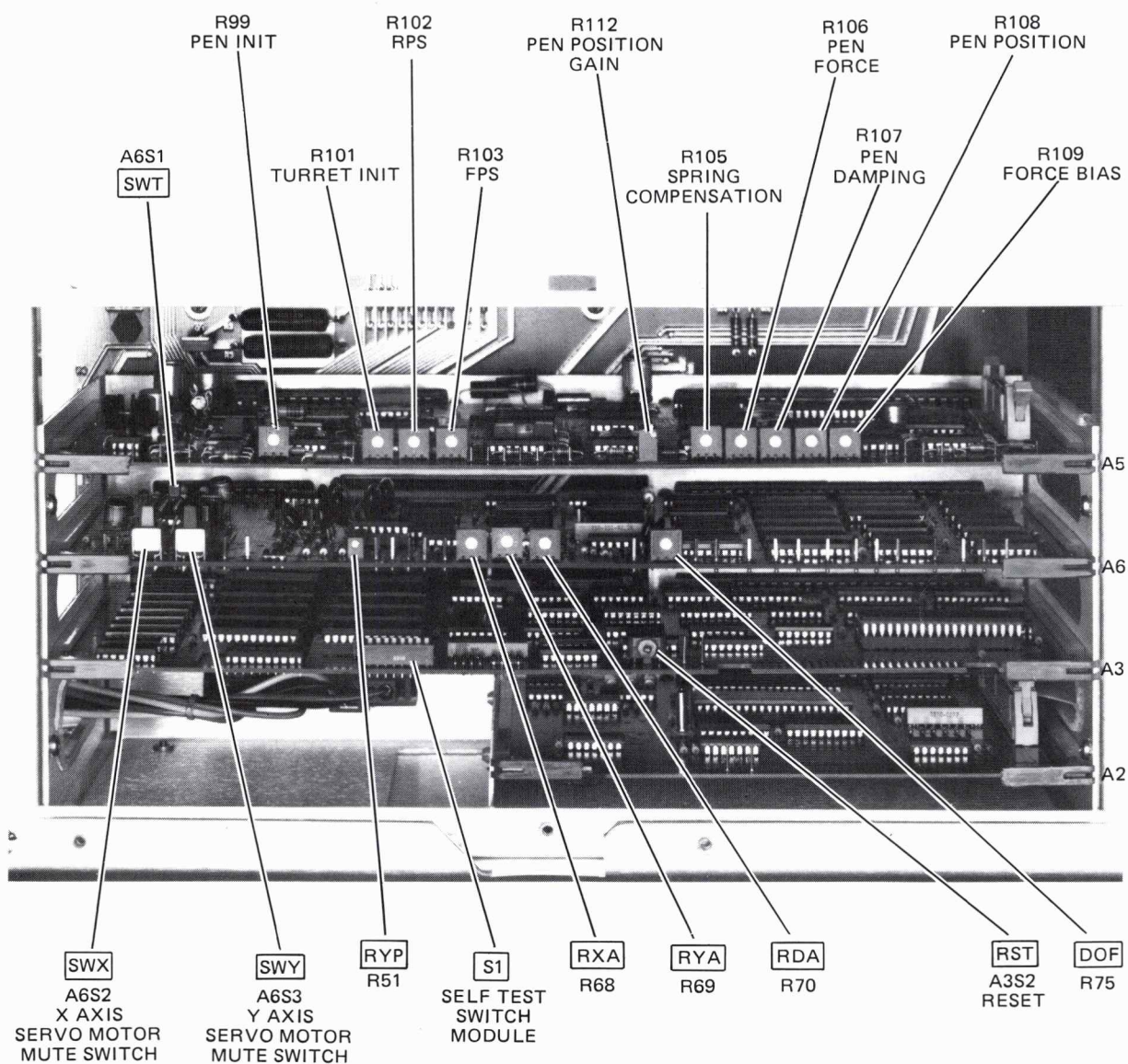
TEST NUMBER	DESCRIPTION OF TEST	OPERATOR ACTION	TEST SWITCHES POSITION	PURPOSE
4	PROVIDES CONTINUOUS AUTOMATIC PEN PICKING FOR TROUBLESHOOTING OF THE PEN CIRCUITS. PICKS PENS 8 THROUGH 1 AND THEN 1 THROUGH 8 REPEATEDLY UNTIL INTERRUPTED BY THE OPERATOR.	SET THE SELF TEST MODE SWITCH S8 ON THE PROCESSOR PCA TO ON SET TEST SWITCH S3 ON THE PROCESSOR PCA TO ON PRESS THE CONFIDENCE TEST SWITCH ON THE REAR PANEL PCA TURN ALL SELF TEST SWITCHES OFF AND PUSH THE RESET BUTTON AT THE COMPLETION OF THE TEST		CHECKS THE OPERATION OF THE PEN PICKING CIRCUITRY.
5	ALLOWS PROGRAMMING OF THE ELECTRICALLY ALTERABLE READ ONLY MEMORY (EAROM) ON THE INTERNAL I/O PCA FOR STORING CONSTANTS USED IN COMPENSATION OF MECHANICAL TOLERANCES.	CONNECT EXTERNAL CONTROLLER (i.e., DESKTOP COMPUTER) TO THE PLOTTER. SET SELF TEST MODE SWITCH S8 ON THE PROCESSOR PCA TO ON SET TEST SWITCHES S1 AND S3 ON THE PROCESSOR PCA TO ON INPUT COMMANDS USING THE FOLLOWING FORMAT: W (ADDRESS) D (DATA) D; WRITE DATA INTO ADDRESS IN RAM AREA R (ADDRESS) D (DATA) D; READ A BYTE FROM RAM AREA P (ADDRESS) D (DATA) D; PROGRAM RAM AREA INTO EAROM ADDRESS – A DECIMAL ASCII (WORD) FROM 4849 TO 5451 DATA – A DECIMAL ASCII (WORD) FROM 484848 TO 505353 D – ANY PUNCTUATION MARK OR SPACE TURN ALL SELF TEST SWITCHES OFF AND PUSH THE RESET BUTTON AT THE COMPLETION OF THE TEST.		VERIFIES THE INTEGRITY OF THE EAROM, CHECKS THE READ/ WRITE CAPABILITY AND TESTS FOR CORRECT FUNCTIONING OF ALL ASSOCIATED CIRCUITRY.

Figure 3-2. Calibration Test
(Sheet 2 of 2)

Table 3-2. Adjustment and Test Point Definitions

MNEMONIC	DEFINITION
ACOM	Analog common
CCK	Counter clock
COM	Common
CVK	Velocity counter loading clock
DAC	Digital to Analog Converter output
DCOM	Digital common
DOF	DAC output amplifier dc offset
FPS	Front Paper Sensor
PUP	Power up pulse
RDA	DAC dc offset
RLY	Relay
RPS	Rear Paper Sensor
RXA	X-Axis amplifier dc offset
RXP	X-position gain
RYA	Y-Axis amplifier dc offset
RYP	Y-position gain
SXE	X-Axis position multiplexer control signal
SXV	X-Axis velocity multiplexer control signal
SYE	Y-Axis position multiplexer control signal
SYV	Y-Axis velocity multiplexer control signal
TBA	DAC output amplifier bias
XA	X-Axis amplifier output
$\overline{\text{XEN}}$	X-Axis encoder count
XP	X-Axis position signal
XSP	X-Axis position gain
XSV	X-Axis velocity gain
$\overline{\text{XUD}}$	X-Axis encoder direction
XV	X-Axis velocity signal
YA	Y-Axis amplifier output
$\overline{\text{YEN}}$	Y-Axis encoder count
YP	Y-Axis position signal
YSP	Y-Axis position gain
YSV	Y-Axis velocity gain
$\overline{\text{YUD}}$	Y-Axis encoder direction
YV	Y-Axis velocity signal



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Figure 3-3. Location of Electrical Adjustments and Test Points (Sheet 1 of 3)

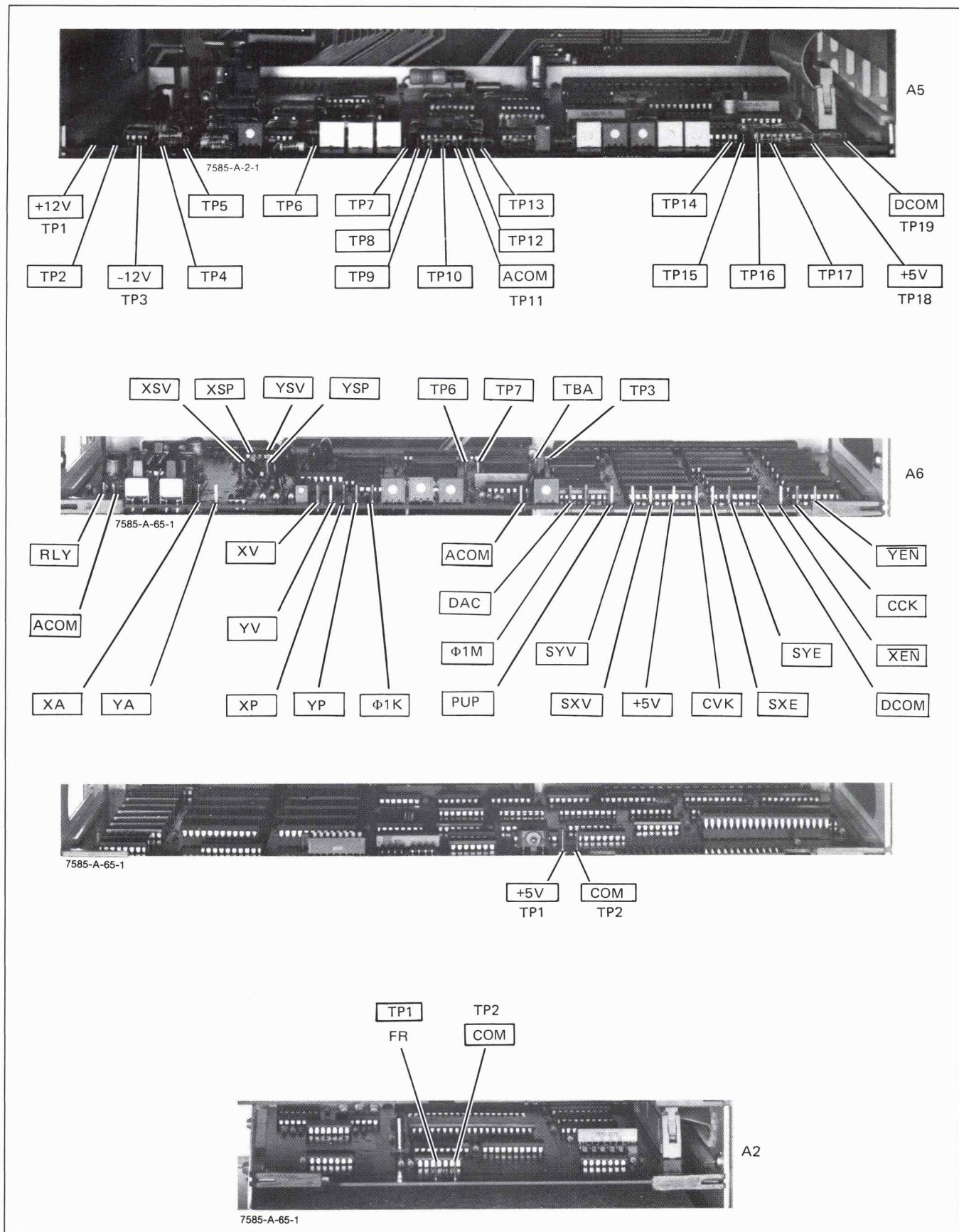


Figure 3-3. Location of Electrical Adjustments and Test Points (Sheet 2 of 3)

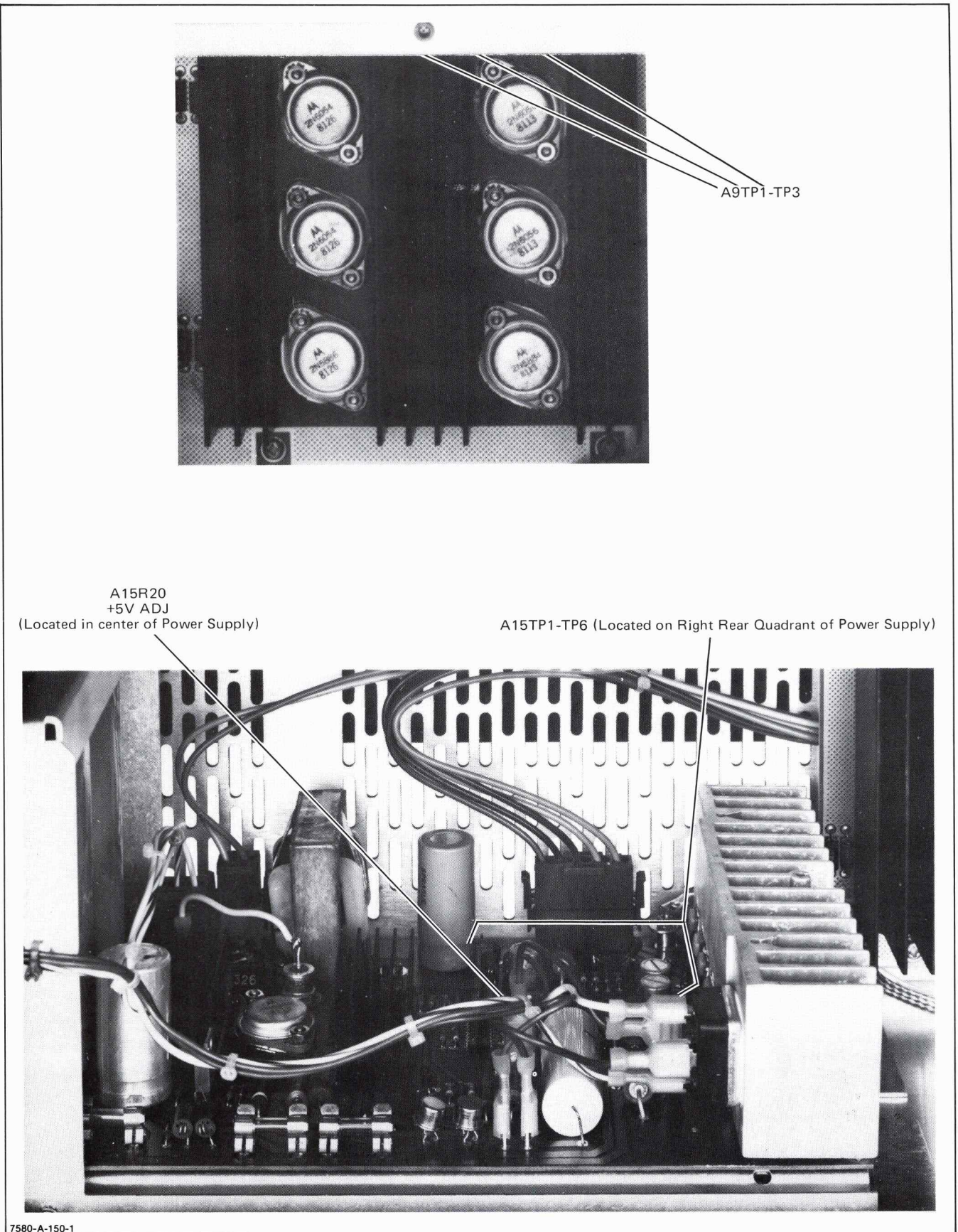


Figure 3-3. Location of Electrical Adjustments and Test Points (Sheet 3 of 3)

Table 3-3. Electrical Adjustments — Quick Reference Guide

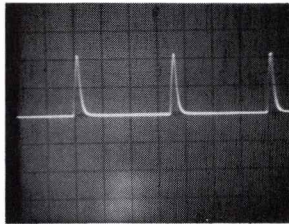
ADJUSTMENT NAME	LOCATION	ADJUSTMENT REF. DESIG.	READING	PROCEDURE
Power Supply +5 volt Adjustment	Power Supply PCA (A15)	A15R20	+5.00 V (± 0.05 V)	Connect multimeter between +5 V and ACOM test points on Servo PCA (A6).
Pen Carriage Initialization Adjustment	Internal I/O PCA (A5)	A5R99	2 Vpk pulse waveform 	Disconnect Servo PCA (A6). Set scope to dc input, 0.1 V/div vertical sensitivity (10:1 probe), 0.2 ms/div horizontal sweep. Connect scope between TP4 and TP19.
Pen Carousel Initialization Adjustment	Internal I/O PCA (A5)	A5R101	1.5 kHz 6% 2 Vpk pulse waveform	Disconnect Servo PCA (A6). Set scope to dc input 0.1 V/div vertical sensitivity (10:1 probe), 0.2 ms/div horizontal sweep. Connect scope between TP8 and TP19. Position carousel initialization reflector strip in front of carousel initialization sensor.
Pen Lift Adjustment	Internal I/O PCA (A5)	A5R112 A5R108 A5R112 A5R108 A5R105	0.00 V (± 0.10 V) +6.00 V (± 0.10 V) +5.60 V (± 0.05 V)	Turn servo motor switches S2 and S3 on Servo PCA (A6) OFF. Manually move pen carriage until relay on Main Interconnect PCA (A10) opens. Adjust fully clockwise (CW). Connect multimeter between TP13 and TP19. Press pen holder down. Eliminate interaction between R112 and R108. Press pen holder down. Adjust fully counterclockwise (CCW). Turn plotter OFF. Turn servo motor switches S2 and S3 on Servo PCA (A6) ON. Turn plotter ON. Load paper. Invoke VIEW state. Set pen force on all pens to 1. Pen up.

Table 3-3. Electrical Adjustments — Quick Reference Guide (Continued)

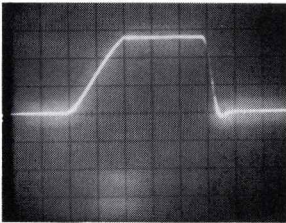
ADJUSTMENT NAME	LOCATION	ADJUSTMENT REF. DESIG.	READING	PROCEDURE
Pen Lift Adjustment (Continued)		A5R109	+0.150 V (± 0.005 V)	Set pen lift adjustment tool into pen holder.
		A5R106	0.000 V (± 0.005 V)	Remove pen lift adjustment tool.
				Eliminate interaction between R106 and R109.
		A5R105		Pen down.
				Adjust fully clock wise (CW).
		A5R105		Press pen holder down.
				Adjust CCW until pen holder just lifts up.
		A5R109	+0.080 V (± 0.005 V)	Pen up.
				Set scope to dc input, 0.2 V/div. vertical sensitivity (10:1 probe), 20 msec/div horizontal sweep.
				Connect scope between TP13 and TP19.
		A5R107	40 ms rise time on waveform	Select Calibration Test 0.
				
			7580-A-30-1	
Paper Sensor Adjustments	Internal I/O PCA (A5)			Set scope to dc input, 0.1 V/div vertical sensitivity (10:1 probe), 0.1 ms/div horizontal sweep.
		A5R103		Install mylar sheet.
				Adjust fully clockwise (CW).
		A5R103	>1 V pk but ≤ 6 V pk waveform including any dc component	Connect scope between TP7 and TP11.
				Select Self-Test 5.
		A5R102		Adjust fully clockwise (CW).
				Connect scope between TP10 and TP11.
		A5R102	>1 V pk but ≤ 6 V pk waveform including any dc component	Select Self-Test 6.

Table 3-3. Electrical Adjustments — Quick Reference Guide (Continued)

ADJUSTMENT NAME	LOCATION	ADJUSTMENT REF. DESIG.	READING	PROCEDURE
Position Gain Adjustment	X- and Y-Axis Servo PCA (A6)	A6R51	5.80 kilohms (± 0.01 kilohms)	Connect multimeter between YP and YSP test points on Servo PCA (A6).
DAC Offset Adjustments	X- and Y-Axis Servo PCA (A6)	A6R70		Select Self-Test 11.
		A6R75	≤ 0.50 mV	Adjust to mid-range. Connect multimeter between TBA and ACOM test points on Servo PCA (A6).
		A6R70	≤ 2.0 mV	Connect multimeter between DAC and ACOM test points on Servo PCA (A6). Eliminate interaction between R70 and R75.
				Connect multimeter between XP and ACOM test points on Servo PCA (A6).
		A6R70	0.00 V (± 0.01 V)	Select Self-Test 11.
		A6R70	0.00 V (± 0.01 V)	Connect multimeter between XV and ACOM test points on Servo PCA (A6).
		A6R70	0.00 V (± 0.01 V)	Connect multimeter between YP and ACOM test points on Servo PCA (A6).
		A6R70	0.00 V (± 0.01 V)	Connect multimeter between YV and ACOM test points on Servo PCA (A6). Eliminate interaction between XP, XV, YP, and YV readings.
Power Amplifier dc Offset Adjustments	X- and Y-Axis Servo PCA (A6)			Connect multimeter between XA and ACOM test points on Servo PCA (A6).
				Set the [SWT] switch, S1, on the Servo PCA (A6) into the TEST position.
		A6R68	0.00 V (± 0.05 V)	Select Self-Test 11.
		A6R69	0.00 V (± 0.05 V)	Connect multimeter between YA and ACOM test points on Servo PCA (A6). Set the [SWT] switch, S1, on the Servo PCA (A6) into the NORMAL position.

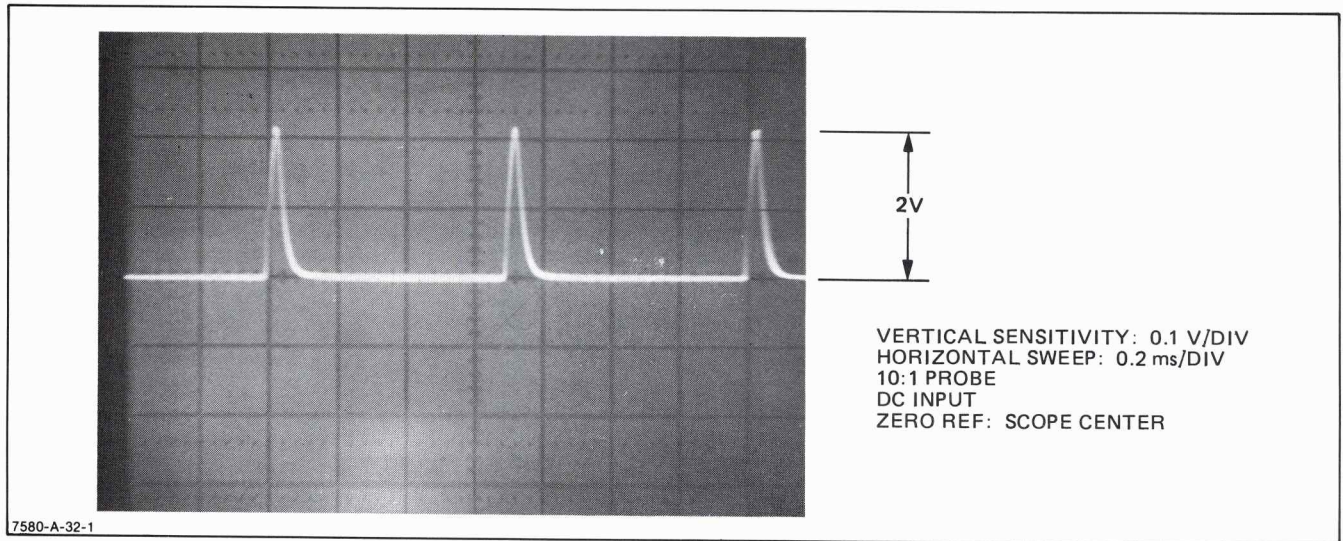


Figure 3-4. Pen Initialization Adjustment Waveform

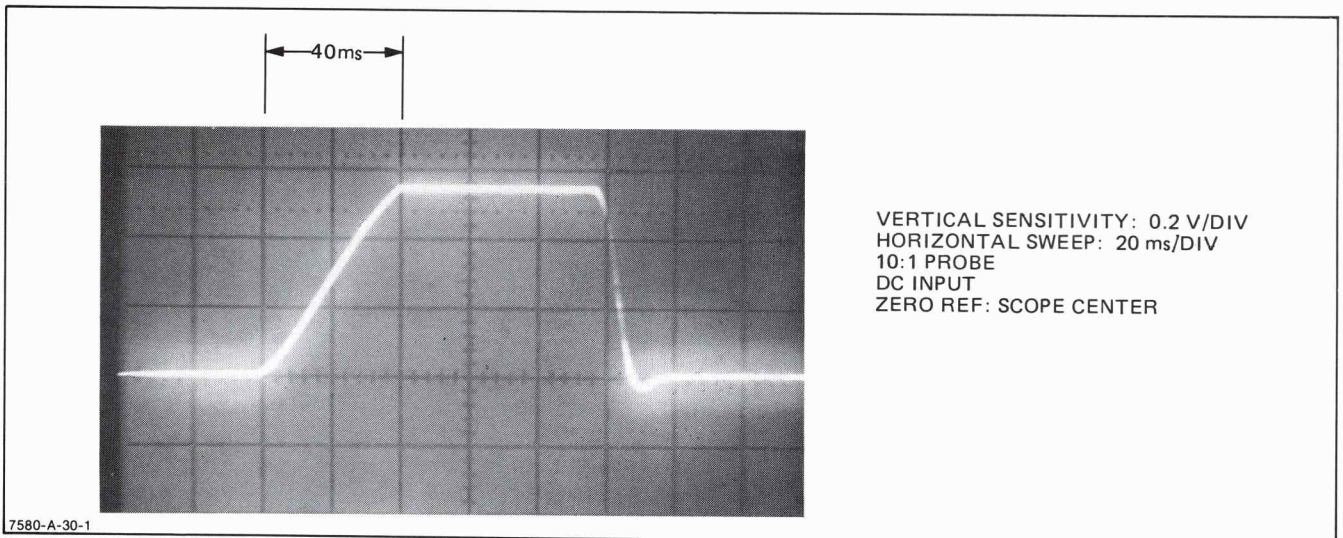


Figure 3-5. Pen Damping Adjustment Waveform

3-26. PAPER SENSOR ADJUSTMENTS

3-27. To adjust the front and rear paper sensors for proper media detection, perform the following steps:

- a. Turn the plotter OFF. Remove the front table and front cover. If necessary, refer to the procedure on Opening up the Plotter given in this section.
- b. Set oscilloscope to dc input, 0.1 volt/division vertical sensitivity, 0.1 millisecond/division horizontal sweep.
- c. Load a sheet of media onto the plotter.
- d. Connect oscilloscope probe between test point #7 (TP7) and test point #11 (TP11) on the Internal I/O PCA A5.
- e. Adjust the front paper sensor potentiometer R103 on the Internal I/O PCA A5 fully clockwise (CW).
- f. Turn the plotter ON.
- g. Select Self-Test 5 on the self-test switch module S1 on the Processor PCA A3. See Self-Test in Section II.
- h. Adjust the front paper sensor potentiometer R103 on the Internal I/O PCA A5 for a maximum peak waveform on the scope not to exceed 2 V.
- i. Connect oscilloscope probe between test point #10 (TP10) and test point #11 (TP11) on the Internal I/O PCA A5.
- j. Adjust the rear paper sensor potentiometer R102 on the Internal I/O PCA A5 fully clockwise (CW).

- k. Select Self-Test 6 on the self-test switch module S1 on the Processor PCA A3. See Self-Test in Section II.
 - l. Adjust the rear paper sensor potentiometer R102 on the Internal I/O PCA A5 for a maximum peak waveform on the scope not to exceed 2 V.
- 3-28. POSITION AND VELOCITY GAIN ADJUSTMENTS
- 3-29. Adjustment of the Y-Axis position gain is performed as follows:
- a. Turn the plotter OFF. Remove the front table and front cover. If necessary, refer to the procedure on Opening up the Plotter given in this section. Remove IC U38 from its socket on the X- and Y-Axis Servo PCA A6.
 - b. Connect the multimeter between the YP and YSP test points on the X- and Y-Axis Servo PCA A6.
 - c. Adjust the RYP adjustment potentiometer R51 on the X- and Y-Axis Servo PCA A6 for a reading of 5.80 kilohms (± 0.01 kilohms).
 - d. Reinsert U38 into its socket.
- 3-30. DIGITAL TO ANALOG CONVERTER (DAC) OFFSET ADJUSTMENTS
- 3-31. To adjust the DAC offset, perform the following steps:
- a. Turn the plotter OFF. Remove the front table and front cover. If necessary, refer to the procedure on Opening up the Plotter given in this section.
 - b. Select Self-Test 11 (eleven) on the self-test switch module S1 on the Processor PCA A3. See Self-Test in Section II.
 - c. Set the RDA adjustment potentiometer R70 on the X- and Y-Axis Servo PCA A6 at approximately midpoint of its range.
 - d. Connect the multimeter between the TBA and ACOM test points on the X- and Y-Axis Servo PCA A6.
 - e. Turn the plotter ON.
 - f. Adjust the DOF potentiometer R75 for a reading of ≤ 0.50 millivolts.
 - g. Connect the multimeter between the DAC and ACOM test point on the X- and Y-Axis Servo PCA A6.
 - h. Adjust the RDA adjustment potentiometer R70 on the X- and Y-Axis Servo PCA A6 for a reading of ≤ 2.0 millivolts.
 - i. The DOF and RDA adjustments described are interactive. Check and readjust if necessary.
 - j. Connect the multimeter between the XP and ACOM test points on the X- and Y-Axis Servo PCA A6.
 - k. Select Self-Test 11 on the self-test switch module S1 on the Processor PCA A3. See Self-Test in Section II.
 - l. Adjust the RDA adjustment potentiometer R70 on the X- and Y-Axis Servo PCA A6 for a reading of 0.00 volts (± 0.01 volts).
 - m. Connect the multimeter between the XV and ACOM test points on the X- and Y-Axis Servo PCA A6.
 - n. The meter should indicate 0.00 volts (± 0.01 volts). Readjust the RDA adjustment potentiometer R70 if necessary.
 - o. Connect the multimeter between the YP and ACOM test points on the X- and Y-Axis Servo PCA A6.
 - p. The meter should indicate 0.00 volts (± 0.01 volts). Readjust the RDA adjustment potentiometer R70 if necessary.
 - q. Connect the multimeter between the YV and ACOM test points on the X- and Y-Axis Servo PCA A6.
 - r. The meter should indicate 0.00 volts (± 0.01 volts). Readjust the RDA adjustment potentiometer R70 if necessary.
 - s. The XP, XV, YP, and YV adjustments described in this procedure are interactive. Check all readings and readjust, if necessary, until all readings are within tolerance.
- 3-32. POWER AMPLIFIER DC OFFSET ADJUSTMENTS
- 3-33. Adjust the power amplifier dc offset by performing the following steps:
- a. Turn the plotter OFF. Remove the front table and front cover. If necessary, refer to the procedure on Opening up the Plotter given in this section.

- b. Connect the multimeter between the XA and ACOM test points on the X- and Y-Axis Servo PCA A6.
- c. Select Self-Test 11 on the self-test switch module S1 on the Processor PCA A3. See Self-Test in Section II.
- d. Turn the plotter ON.
- e. Adjust the RXA adjustment potentiometer R68 on the X- and Y-Axis Servo PCA A6 for a reading of 0.00 volts (± 0.05 volts).
- f. Connect the multimeter between the YA and ACOM test points on the X- and Y-Axis Servo PCA A6.
- g. Adjust the RYA adjustment potentiometer R69 on the X- and Y-Axis Servo PCA A6 for a reading of 0.00 volts (± 0.05 volts).

3-34. JOYSTICK NULL ADJUSTMENT

3-35. To ensure a zero output from the joystick when in the null position, perform the following procedure:

- a. Turn the plotter OFF.
- b. Remove the front table and front cover. If necessary, refer to the procedure on Opening up the Plotter described earlier in this section.
- c. Release the front-panel cover and disconnect the ribbon cable and supplementary carriage cover microswitch connector from the Front Panel PCA.
- d. Disconnect the joystick grounding strap and release the joystick assembly from the front panel. Do not disconnect the joystick wires from the Front Panel PCA. See Figure 3-6.
- e. Connect the ribbon cable and supplementary carriage cover microswitch connector to the Front Panel PCA.
- f. Turn the plotter ON.
- g. Select Self-Test 7 on the self-test switch module S1 on the Processor PCA A3. See Self-Test in Section II.
- h. Hold the joystick assembly firmly and rotate the body of the joystick X-axis potentiometer until the front-panel A/N display is 80. Be sure the joystick itself is not moved from its null position while adjusting the potentiometer. See Figure 3-6.
- i. Select Self-Test 8. See Self-Test in Section II.
- j. Repeat step h. except rotate the Y-axis potentiometer instead of the X-axis potentiometer. See Figure 3-6.
- k. Turn the plotter OFF.

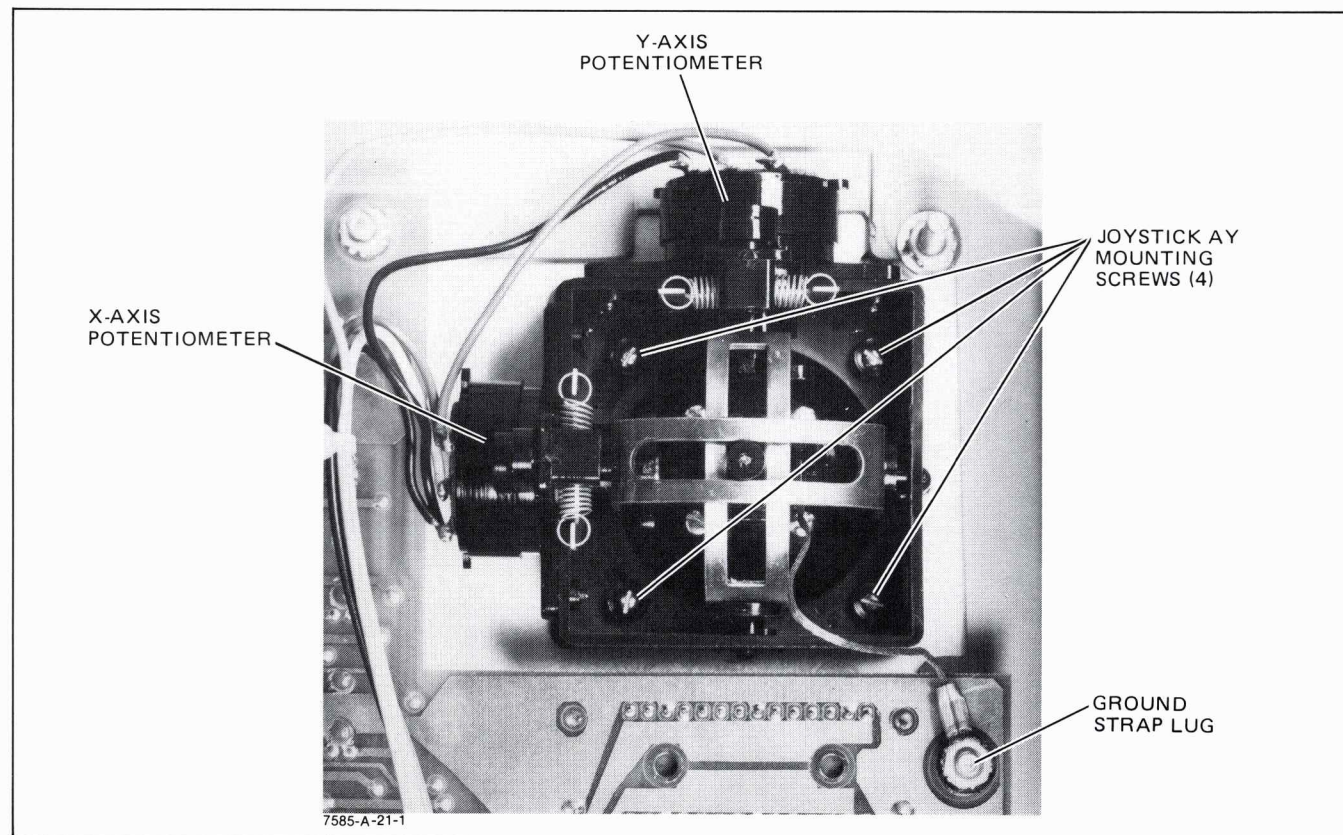


Figure 3-6. Joystick Null Adjustment

- l. Disconnect the ribbon cable and microswitch connector from the Front Panel PCA.
- m. Install the joystick assembly on the front panel and connect the joystick grounding strap.
- n. Connect the ribbon cable and microswitch connector to the Front Panel PCA.
- o. Install the front-panel cover.
- p. Install the front cover and front table.
- e. Insert the Y-arm parallelism alignment tool, HP P/N 07585-60301, into the pen holder.
- f. Loosen both front and rear left end Y-arm parallelism adjustment screws.
- g. The left end of the Y-arm may now be pivoted forward or backward to adjust for parallelism.
- h. Adjustment is achieved when the alignment tool is centered in the platen groove.
- i. To adjust the parallelism, press the left end of the Y-arm forward against the setscrew and adjust the setscrew clockwise (CW) to move the left end of the Y-arm backward or counterclockwise (CCW) to allow the Y-arm to move forward.
- j. Tighten the left end adjustment setscrews.
- k. Position the pen holder in front of the right-hand edge of the large grit tube.
- l. Perform steps f. through j. of this procedure for the right end Y-arm parallelism adjustment setscrews.
- m. Tighten the three screws securing the Y-arm mounting plate to the left side plate.
- n. Tighten the two screws securing the right-hand end of the Y-arm to the right side plate.
- o. Recheck the parallelism and readjust if necessary.
- p. Perform the pen carousel height and initialization sensor adjustments described later in this section.

3-36. MECHANICAL ADJUSTMENTS

NOTE

The Electrically Alterable Read Only Memory (EAROM) on the Internal I/O PCA A5 must be reprogrammed whenever the Y-Arm Assembly or Paper Sensor Assembly is replaced or the Paper Stop Assembly is adjusted. The EAROM is programmed through use of the HP 85 Service System and EAROM Reprogramming Tape, which are listed in Table 3-1. The HP 85 and EAROM tape can be used in both HP-IB and RS-232-C interface modes.

Reprogramming the EAROM is necessary for calibration of the Y-arm whenever it is replaced and for setting the paper sensor default parameters (paper edge margins) whenever the Paper Sensor Assembly is replaced. Reprogramming the EAROM after adjusting the Paper Stop Assembly compensates for mechanical tolerances when setting margins.

3-37. Y-ARM PARALLELISM ADJUSTMENT

3-38. This adjustment is designed to assure accurate parallelism of line traces in reference to the X- and Y-axis. Perform the following steps:

- a. Turn the plotter OFF. Remove the carousel and front-panel covers. Remove the carriage cover. If necessary, refer to the procedure on Opening up the Plotter given in this section.
- b. Loosen the three screws securing the Y-arm mounting plate to the left side plate. See Figure 3-7, Detail A.
- c. Loosen the two screws securing the right-hand end of the Y-arm to the right side plate. See Figure 3-7, Detail B. Position the pen holder in front of the left-hand pinch wheel.
- d. Two setscrews in the side plates at the ends of the Y-arm allow the Y-arm assembly to be removed and replaced without disturbing the parallelism adjustment and also serve as the adjustment screws.

3-39. Y-ARM HEIGHT ADJUSTMENT

3-40. The Y-Arm Height Adjustment is designed to ensure writing quality by eliminating pen drag or pen skipping as the pen traverses the media. This adjustment must be performed after replacement of the platens, side plates, Y-arm, or pen carriage. The number of shims required on each end of the Y-arm will be calculated for adjustment of the Y-arm height. Several voltage readings requiring the use of a multimeter will be taken in this procedure. To adjust the Y-arm height, refer to Figure 3-8 and proceed as follows:

NOTE

The pen lift circuit must be properly adjusted prior to performing the Y-arm height adjustment.

- a. Make sure the pen holder is empty and no media is in the plotter.
- b. Remove the front table and front cover. If necessary, refer to the procedure on Opening up the Plotter given in this section.
- c. Make sure the carriage cover is lowered into the closed position.

(Continued on page 3-21)

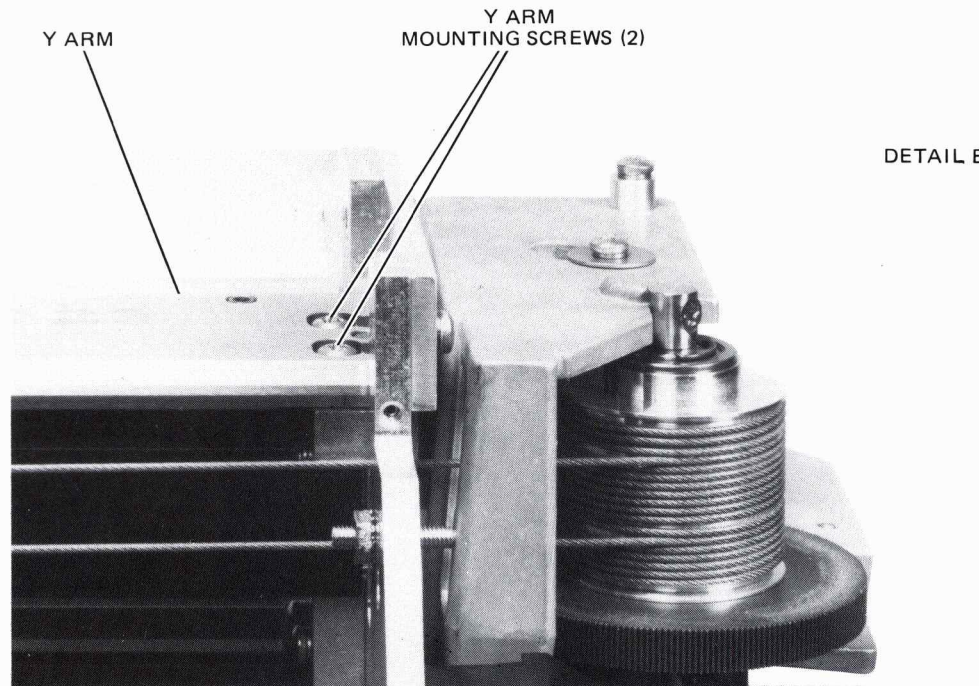
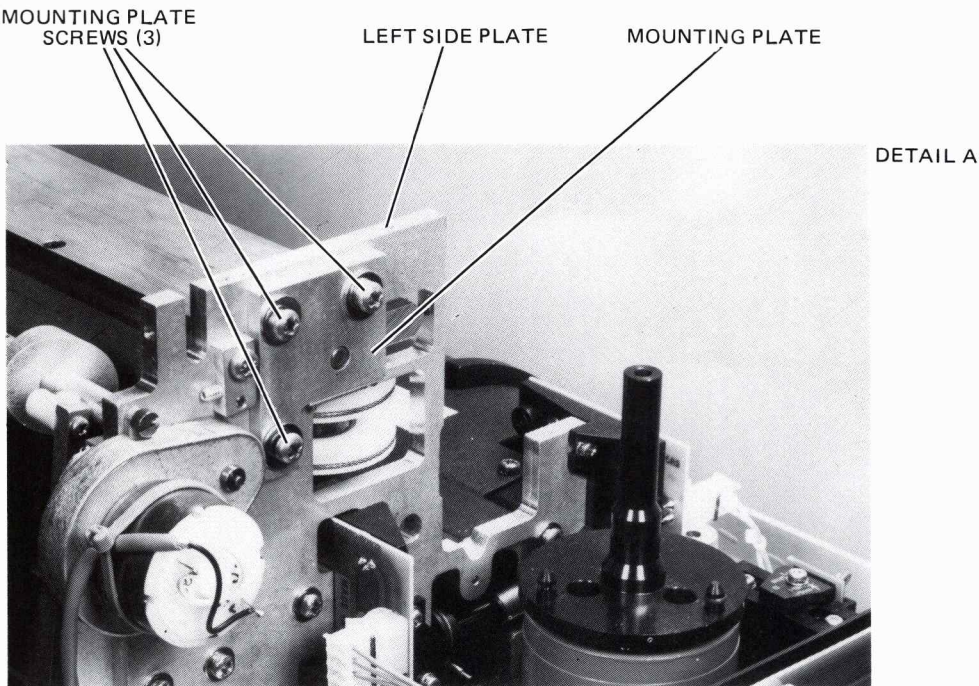
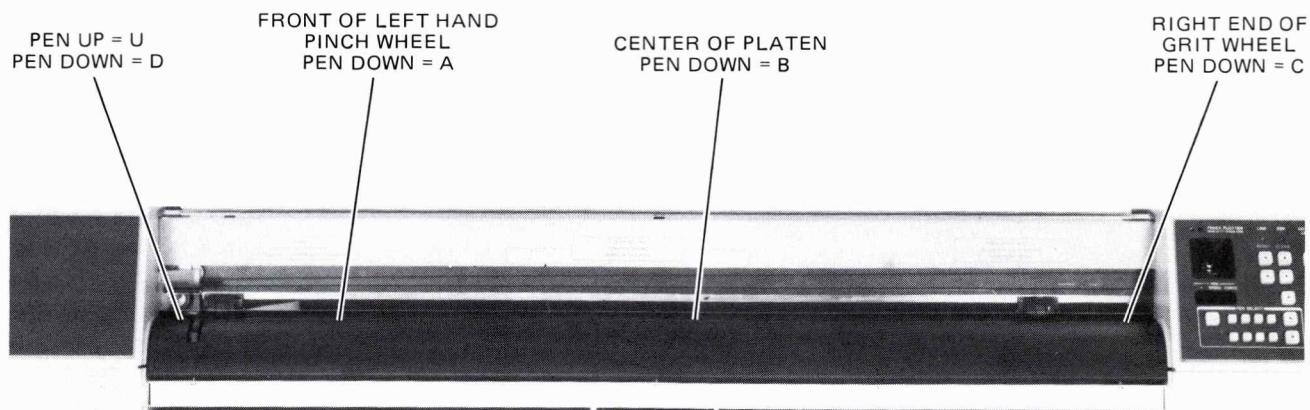


Figure 3-7. Y-Arm Mounting



7580-A-217-1

$$K = \frac{0.155}{(D-U)}$$

$$S = K(C-A)$$

$$H = \frac{K(A+C-2B)}{2}$$

$H = \text{LARGEST } H_n \text{ VALUE}$

IF $H \geq 0$ THEN $L = 0.092 + H$

IF $H < 0$ THEN $L = 0.092$

$$N = L - K(A-U) + \frac{S}{11.0}$$

$$M = N - S \quad (1.1)$$

$$\# \text{ THIN SHIMS (LEFT END)} = \text{INT} \frac{N}{0.005} + 0.5$$

$$\# \text{ THIN SHIMS (RIGHT END)} = \text{INT} \frac{M}{0.005} + 0.5$$

WHERE INT SIGNIFIES THE INTEGER PART OF THE EQUATION IN PARENTHESIS.

THIN SHIM = 0.005 IN.

THICK SHIM = 0.020 IN.

LET $X = \# \text{ THIN SHIMS (LEFT END)}$

LET $Y = \# \text{ THIN SHIMS (RIGHT END)}$

A COMBINATION OF THICK AND THIN SHIMS FOR EACH END CAN BE CALCULATED AS FOLLOWS:

LEFT END

$$\# \text{ THICK SHIMS} = \text{INT} \left(\frac{X}{4} \right)$$

(HP P/N 1600-1281)

$$\# \text{ THIN SHIMS} = X - 4 \left[\text{INT} \left(\frac{X}{4} \right) \right]$$

(HP P/N 1600-1103)

RIGHT END

$$\# \text{ THICK SHIMS} = \text{INT} \left(\frac{Y}{4} \right)$$

(HP P/N 1600-1283)

$$\# \text{ THIN SHIMS} = Y - 4 \left[\text{INT} \left(\frac{Y}{4} \right) \right]$$

(HP P/N 1600-1282)

Figure 3-8. Y-Arm Height Adjustment

- d. Turn the servo motor mute switches S2 and S3 on the X- and Y-Axis Servo PCA A6 to the OFF position.
- e. Turn the plotter ON.
- f. Raise the carriage cover to the open position.
- g. If an E28 error code does not occur on power up, manually move the pen carriage slowly to the right until the A/N display on the front panel does indicate an error code of either E27 or E28.
- h. Connect the multimeter between test point 13 (TP13) and test point 19 (TP19) on the Internal I/O PCA A5.
- i. Gently raise the pen holder to its upper limit of travel. Record the voltage at this point. Typically, a negative value will be indicated. Label the recorded value as U.
- j. Gently press the pen holder down to its lower limit of travel. Record the voltage at this point. Label this recorded value as D.
- k. Insert a new roller-ball pen into the pen holder.
- l. Manually position the pen holder such that the pen is positioned in front of the left-hand pinch wheel.
- m. Gently press the pen holder down so that the pen tip is touching the platen. Record the voltage at this point. Label this recorded value as A.
- n. Manually position the pen holder so that the pen is positioned at the center of the platen.
- o. Gently press the pen holder down so that the pen tip is touching the platen. Record the voltage at this point. Label this recorded value as B.
- p. Manually position the pen holder so that the pen is positioned at the right-most end of the grit wheel.
- q. Gently press the pen holder down so that the pen tip is touching the platen. Record the voltage at this point. Label this recorded value as C.
- r. Using the values D and U from steps i. and j. above, calculate the value of K as follows:

$$K = \frac{0.155}{(D - U)}$$

- s. Using the values A, C, B, and K from steps m., o., q., and r. above, calculate the values S and H as follows:

$$S = K(C - A)$$

$$H = \frac{K(A + C - 2B)}{2}$$

- t. Using the value H from step s., calculate the value L as follows:

$$\text{If } H \geq 0, \text{ then } L = 0.092 + H$$

$$\text{If } H < 0, \text{ then } L = 0.092$$

- u. Using the values of A, K, L, S, and U from steps i., m., n., s., and t. above, calculate the values of M and N as follows:

$$N = L - K(A - U) + \frac{S}{11.0}$$

$$M = N - S(1.1)$$

- v. The number of thin shims required for the left end of the Y-arm is calculated by the following equation:

$$\# \text{ thin shims} = \text{INT} \left(\frac{N}{0.005} + 0.5 \right)$$

where INT signifies the integer part of the equation in parentheses. A negative result indicates the number of shims to be removed from the existing amount.

- w. The number of thin shims required for the right end of the Y-arm is calculated by the following equation:

$$\# \text{ thin shims} = \text{INT} \left(\frac{M}{0.005} + 0.5 \right)$$

where INT signifies the integer part of the equation in parentheses. A negative result indicates the number of shims to be removed.

NOTE

A combination of thick and thin shims for each end can be calculated as follows:

Thin shim = 0.005 in.

Thick shim = 0.020 in.

Let X = # thin shims (left end) from step v.

Let Y = # thin shims (right end) from step w.

Left end shim combination

$$\# \text{ thick shims} = \text{INT} \left(\frac{X}{4} \right)$$

$$\# \text{ thin shims} = X - 4 \left[\text{INT} \left(\frac{X}{4} \right) \right]$$

Right end shim combination

$$\# \text{ thick shims} = \text{INT} \left(\frac{Y}{4} \right)$$

$$\# \text{ thin shims} = Y - 4 \left[\text{INT} \left(\frac{Y}{4} \right) \right]$$

NOTE

The following steps are given to facilitate installation or removal of shims as required.

- x. Turn the plotter OFF and disconnect from the ac line source.
- y. Remove the carousel, front panel, and carriage covers. If necessary, refer to the procedure on Opening up the Plotter given in this section.
- z. Remove the pen carriage from the Y-arm. Refer to the pen carriage replacement procedure described in Section VI.
- aa. Loosen the Y-drive cable tension adjustment screw and locking nut (see Figure 3-11, Detail A).
- ab. Disconnect the Y-drive motor and encoder wires.
- ac. Remove the two mounting screws securing the Y-arm to the right side plate (see Figure 3-7, Detail B).
- ad. Lift the right end of the Y-arm and remove the arm by sliding it to the right.
- ae. Remove the three mounting plate screws and remove the mounting plate (see Figure 3-7, Detail A).
- af. Insert or remove the number of shims on the bottom edge of the mounting plate as calculated. A screw holds the shims in place.
- ag. Install the mounting plate leaving the three mounting screws slightly loose.
- ah. Insert or remove the number of shims on the right side plate as calculated.
- ai. Install the Y-arm back in the plotter.
- aj. Install the Y-arm to right side plate mounting screws leaving the screws slightly loose.
- ak. Hold the left end of the Y-arm forward against the parallelism adjustment setscrew and tighten the three mounting plate screws.
- al. Tighten the two right-hand Y-arm mounting screws.
- am. Connect the Y-drive motor and encoder wires.
- an. Install the pen carriage on the plotter.
- ao. Perform the Y-drive cable tension adjustment procedure described in this section.
- ap. Install the carriage cover, carousel cover, and front-panel cover.
- aq. Install the front cover and front table.
- ar. Perform the confidence test described in Section II to ensure writing quality and that the pen is not dragging or skipping due to improper pen height adjustment.

3-41. STABLE CUP FORK ADJUSTMENT

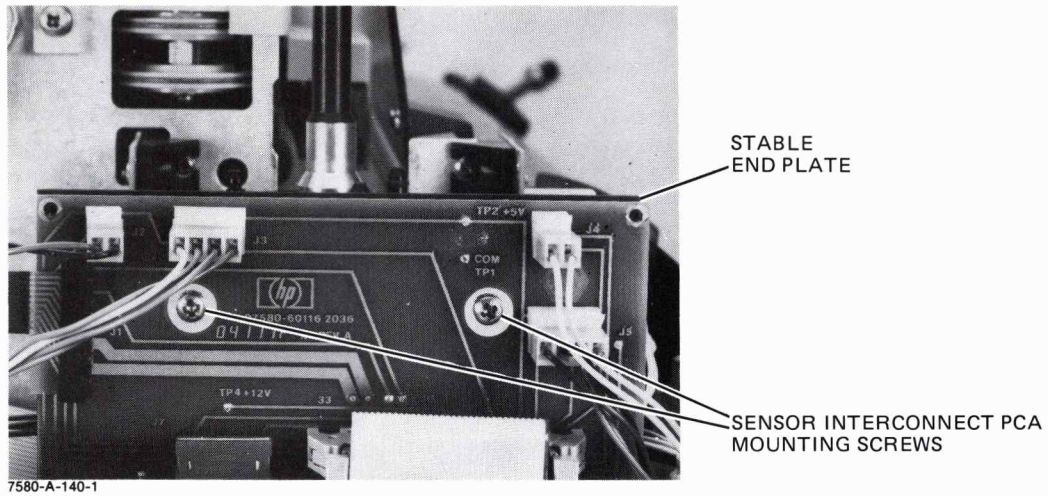
3-42. The stable cup fork adjustment is designed to align the stable cup fork for a proper pen pick when the pen holder enters the carousel to pick a pen. This procedure should be performed when the Y-arm parallelism adjustment has been altered, the pen carriage has been replaced, the stable cup fork, pivot, or spring has been replaced, the pen holder adjustment has been altered, or pen picking problems occur. To perform the stable cup fork adjustment, proceed as follows:

- a. Turn the plotter OFF. Disconnect the ac power cord.
- b. Remove the carousel cover.
- c. Remove the Sensor Interconnect PCA cables and mounting screws. Remove the PCA. See Figure 3-9, Detail A. Remove the stable and plate located behind the Sensor Interconnect PCA.
- d. Remove the four carousel motor mounting screws and remove the motor. See Figure 3-9, Detail B.
- e. Set the fork alignment fixture, HP part number 07580-60207, on the left side plate. See Figure 3-9, Detail C.
- f. Manually position the pen carriage so that the pen holder engages the pen body of the fork alignment fixture. The pointer should align with the index mark on the alignment fixture. See Figure 3-9, Detail C. If the pointer does not align with the index mark, perform the remaining steps in this procedure.
- g. Using a phillips head screwdriver, loosen the four pivot bracket mounting screws. See Figure 3-9, Detail C.
- h. Position the stable cup fork until the pointer is aligned with the index mark on the alignment fixture. The pivot brackets should be as close as possible to the fork to eliminate any possible sideplay of the fork.
- i. Tighten the four pivot bracket mounting screws.
- j. Move the pen holder from the fork alignment fixture and remove the fixture.
- k. Install the carousel motor, stable end plate, and Sensor Interconnect PCA.
- l. Perform the carousel motor adjustment procedure described in this section.

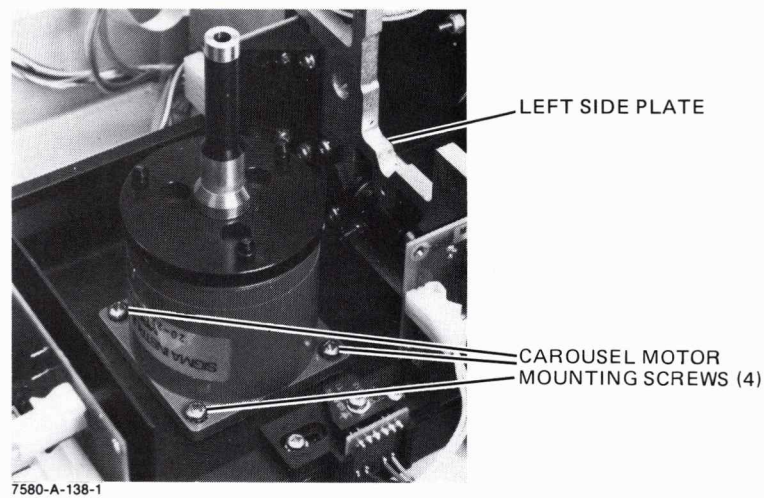
3-43. PEN CAP CABLE TENSION ADJUSTMENT

3-44. To adjust the pen cap cable tension, proceed as follows:

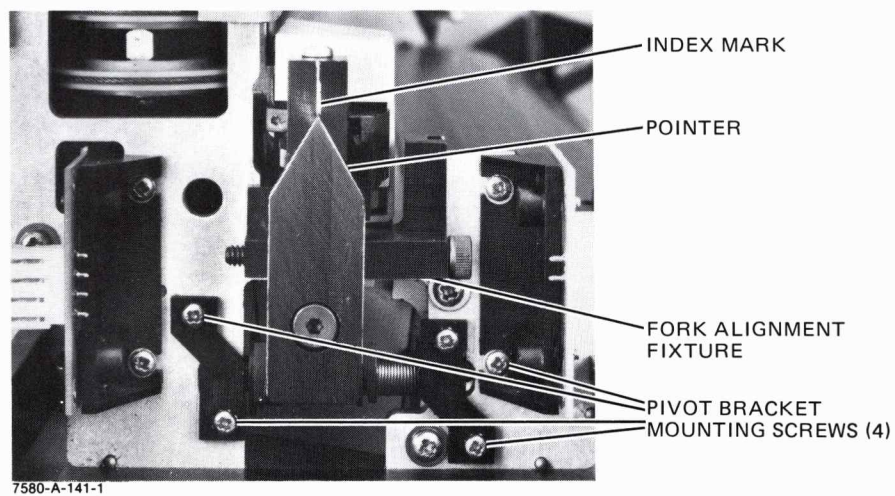
- a. Turn the plotter OFF. Remove the carousel cover. If necessary, refer to the procedure on Opening up the Plotter given in this section.
- b. Manually position the pen carriage so as to engage a pen in the pen carousel.



DETAIL A



DETAIL B



DETAIL C

Figure 3-9. Stable Cup Fork Adjustment

- c. When the pen cap is down, its top should be level with the surface of the pen cap holder in the carousel. See Figure 3-10, Detail A.
- d. If the top of the pen cap is not level with the pen cap holder surface, adjust the pen cap cable tension nut, located on the actuating lever, clockwise (CW) to lower the cap or counterclockwise (CCW) to raise the cap. See Figure 3-10, Detail B.

3-45. Y-DRIVE CABLE TENSION ADJUSTMENT

3-46. If a new cable is installed, manually move the pen carriage back and forth several times through the full length of travel. Perform the tension adjustment as follows:

- a. Turn the plotter OFF. Remove the carousel and front-panel covers. Remove the carriage cover. If necessary, refer to the procedure on Opening up the Plotter given in this section.
- b. Loosen the Y-drive cable adjustment locking nut. See Figure 3-11, Detail A.
- c. Loosen the Y-drive cable adjustment locking screw. See Figure 3-11, Detail A.
- d. Manually position the pen carriage to the extreme left limit of travel.
- e. Place the tip of the tension gauge at approximately the center of the lower length of Y-drive cable and raise the cable until it touches the upper length of the Y-drive cable. The tension should be 400 grams \pm 50 grams. See Figure 3-11, Detail B.
- f. To adjust the cable tension, use an Allen wrench and turn the Y-drive cable tension adjustment screw clockwise (CW) to increase tension or counterclockwise (CCW) to reduce tension. See Figure 3-11, Detail A.
- g. Tighten the Y-drive cable adjustment locking nut.
- h. Manually move the pen carriage back and forth several times through the full length of travel. Recheck the tension and readjust if necessary.
- i. Tighten the Y-drive cable adjustment locking screw.
- j. Install the carriage cover, carousel cover, and front-panel cover.

3-47. PAPER STOP ADJUSTMENTS

3-48. To perform the paper stop adjustments, proceed as follows:

- a. Turn the plotter OFF.
- b. Remove the carousel cover, front table, and front platen. If necessary, refer to the procedure on Opening up the Plotter given in this section.
- c. Load a sheet of paper into the plotter flush against both the front and rear paper stops.

- d. Turn the plotter ON.
- e. Either press the P1 and P2 front-panel push-buttons or use the joystick to move the paper back and forth in the X-axis.
- f. Check that the paper does not skew while moving back and forth. If skew is evident, perform the remaining steps in this procedure.
- g. Loosen the front paper stop adjustment locking screw. See Figure 3-12, Detail A.
- h. Move the front paper stop adjustment to the right to shift the front paper stop right. Move the adjustment left to move the stop to the left. Tighten the paper stop adjustment locking screw.
- i. Insert a 7/64-inch Allen wrench through the access hole near the bottom edge of left side plate. See Figure 3-12, Detail B.
- j. Turn the rear paper stop adjustment screw clockwise (CW) to move the paper stops toward the paper edge or counterclockwise (CCW) to move the stops away from the paper. Adjust so that the stops are fully flush against the paper edge.
- k. Perform the Confidence Test described in Section II of this manual. When the paper stops are properly adjusted, the confidence test plot border closest to the paper stops should be parallel to the paper edge.
- l. Recheck the paper stop adjustment and readjust if necessary.
- m. Reprogram the EAROM using the HP 85 Service System and EAROM Reprogramming tape.

3-49. X- AND Y-MOTOR BACKLASH ADJUSTMENTS

3-50. The X- and Y-motor backlash adjustments are performed as follows:

- a. Turn the plotter OFF. Remove the front-panel cover. If necessary, refer to the procedure on Opening up the Plotter given in this section. Remove the X- and Y-drive motor gear cover.
- b. Loosen the X-motor backlash locking screw. See Figure 3-13.
- c. Loosen the X-motor backlash adjustment screw. See Figure 3-13.
- d. While gently rolling the grit wheel back and forth, turn the X-motor backlash adjustment screw clockwise (CW) until all backlash is removed. This can be felt through the rolling back and forth of the grit wheel. Note that excessive tightening will cause binding on the motor bearings.
- e. Tighten the X-motor backlash locking screw.

(Continued on page 3-28)

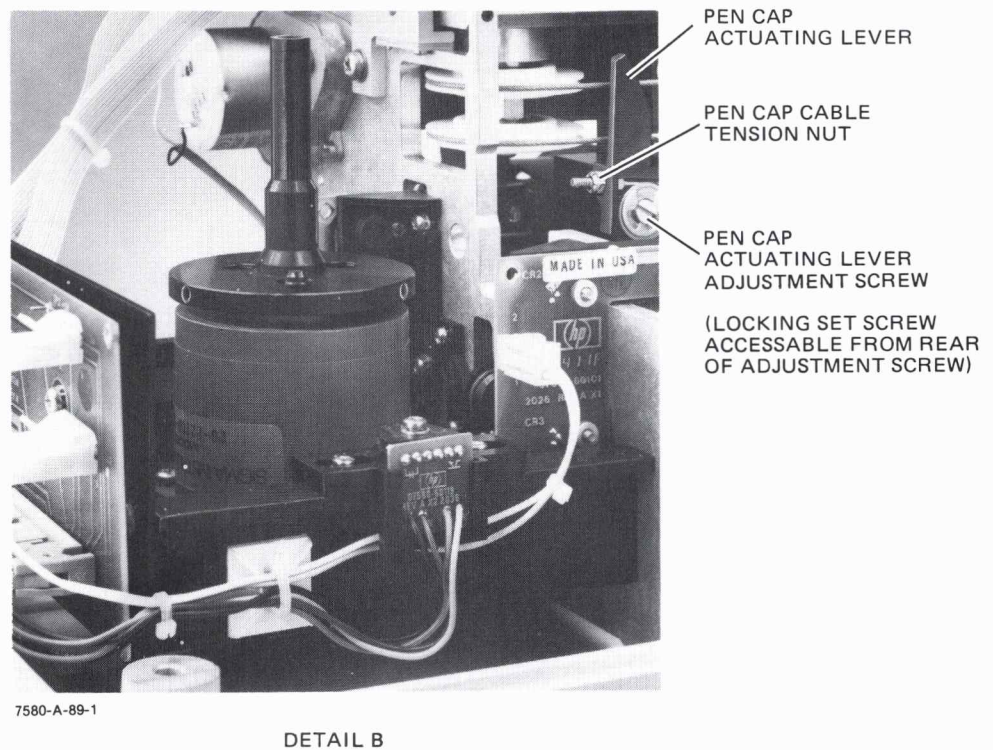
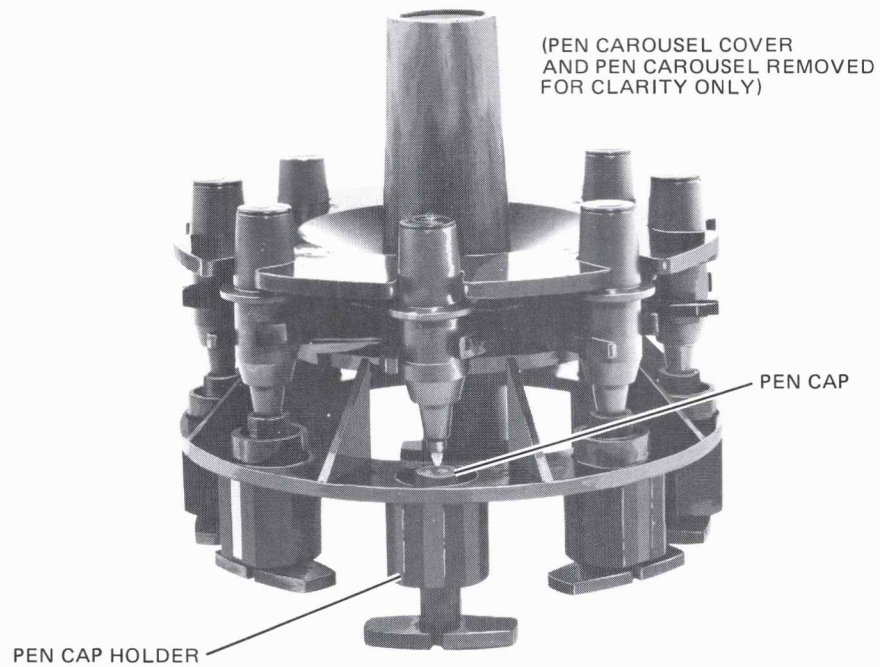


Figure 3-10. Pen Cap Cable Tension and Actuating Lever Adjustments

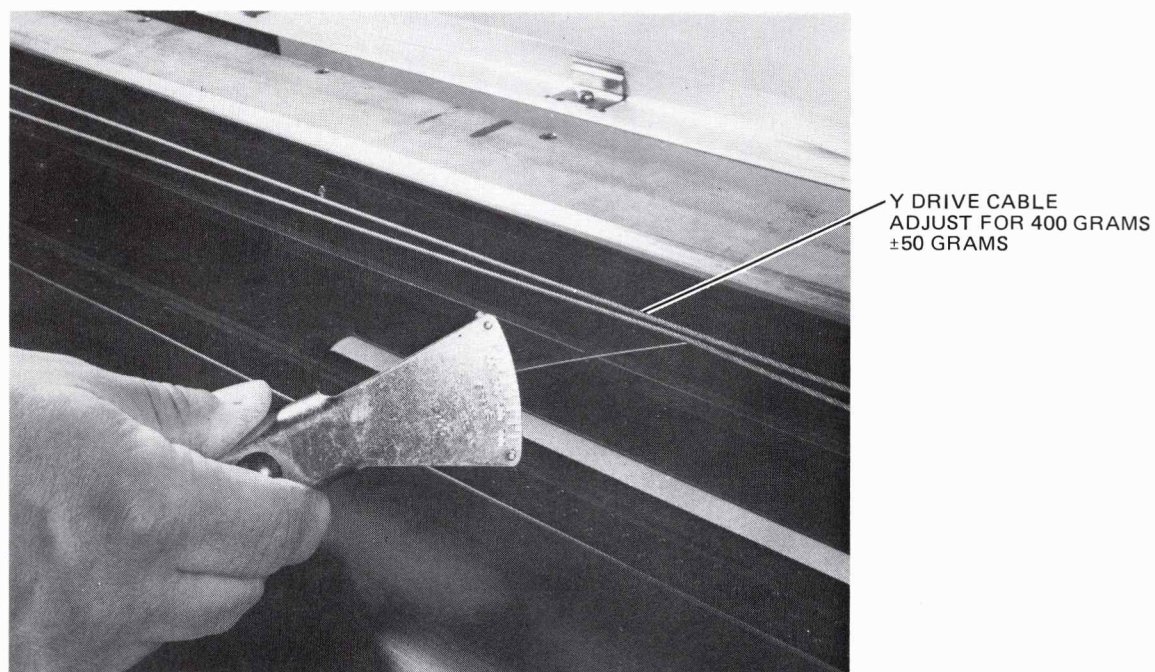
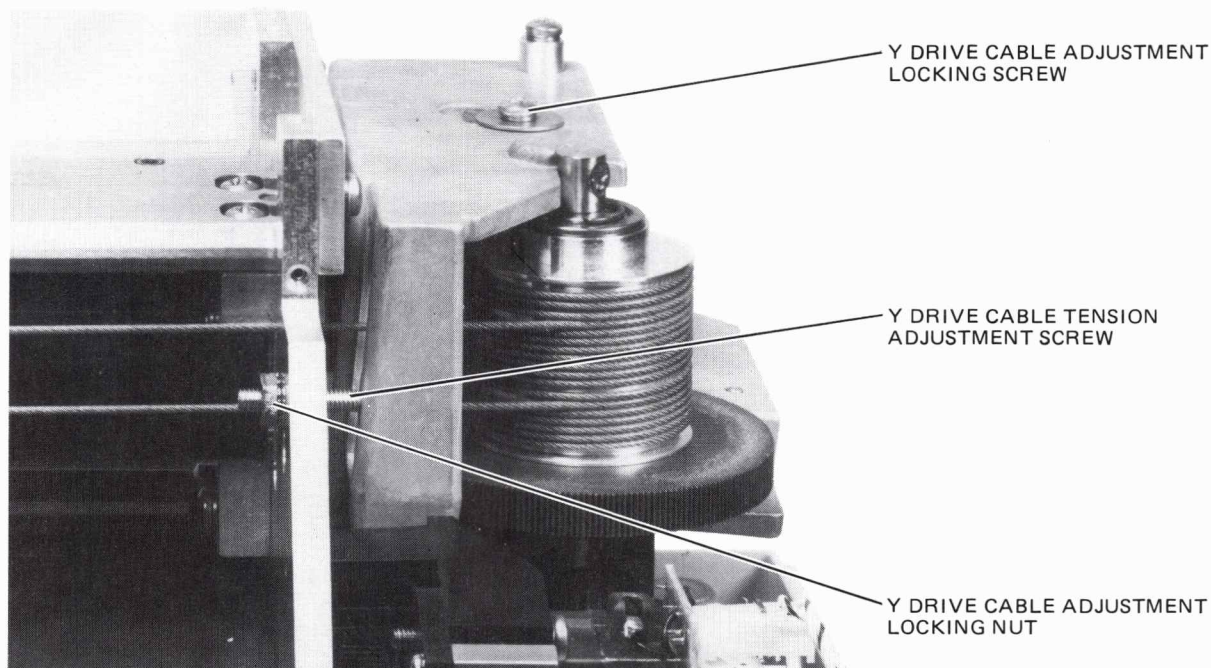
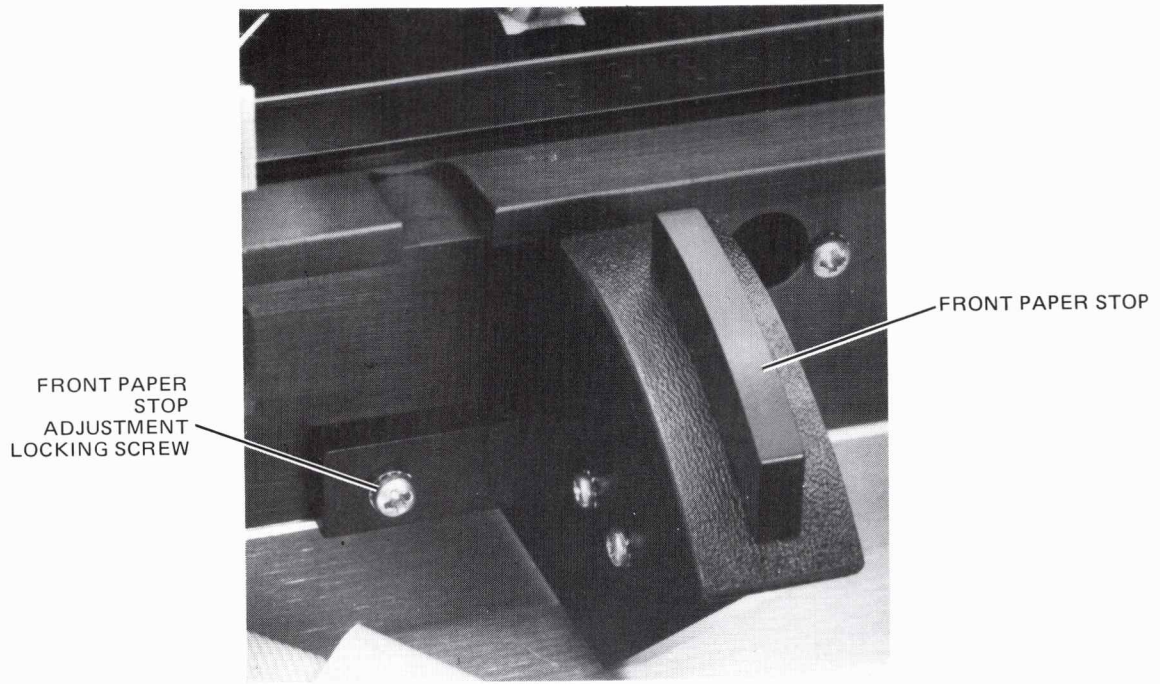
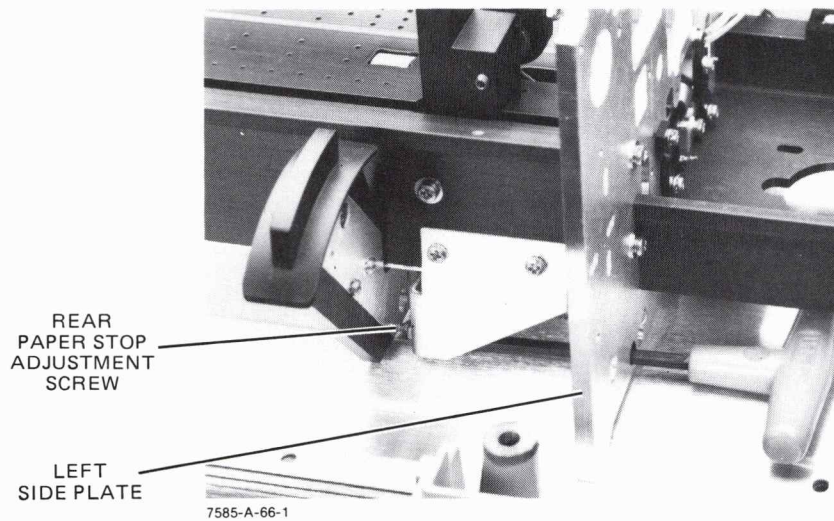


Figure 3-11. Y-Drive Cable Tension Adjustment



DETAIL A



DETAIL B

Figure 3-12. Paper Stop Adjustment

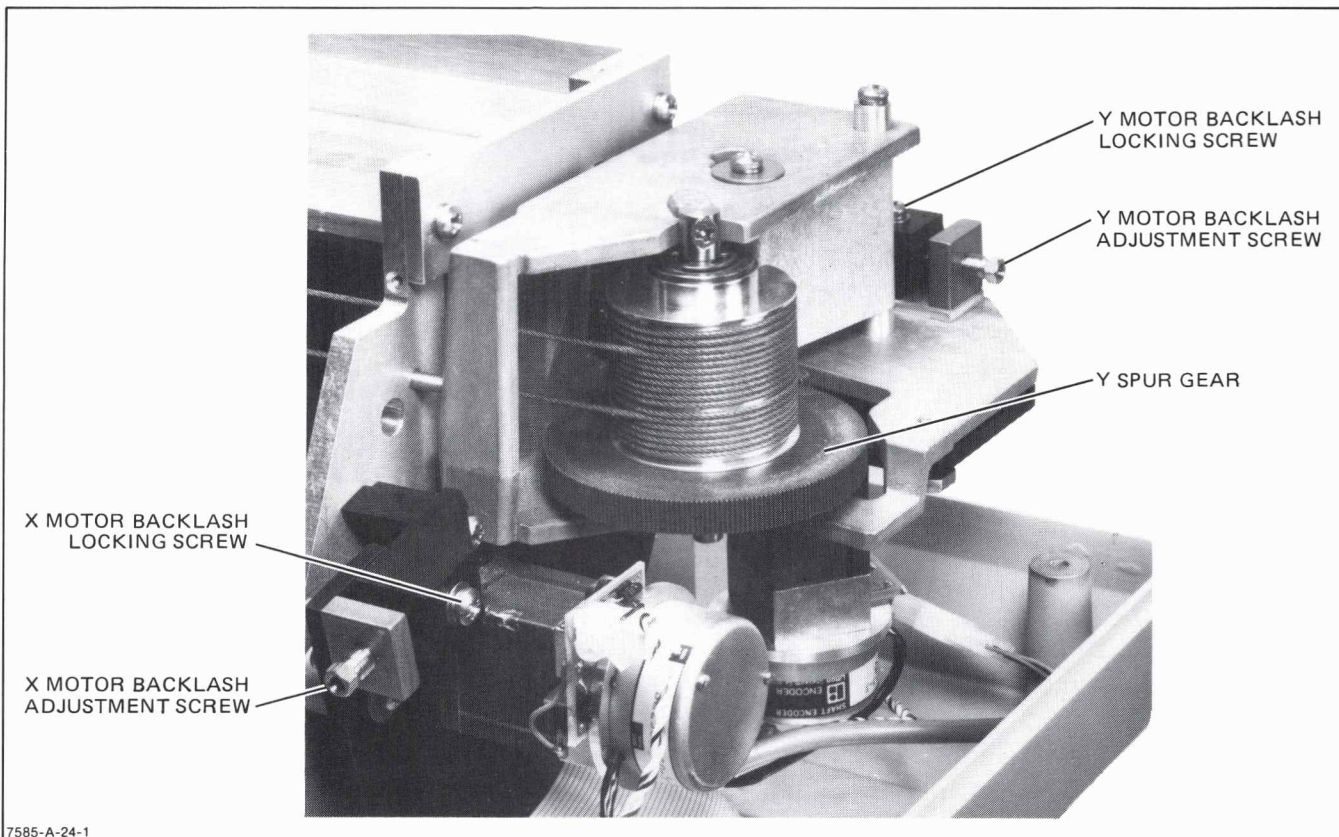


Figure 3-13. X- and Y-Motor Backlash Adjustments

- f. Loosen the Y-motor backlash locking screw. See Figure 3-13.
- g. Loosen the Y-motor backlash adjustment screw. See Figure 3-13.
- h. While gently rolling the Y-spur gear back and forth, adjust the Y-backlash adjustment screw clockwise (CW) until all backlash is removed. This can be felt through the rolling back and forth of the spur gear. Note that excessive tightening will cause binding on the motor bearings.
- i. Tighten the Y-motor backlash locking screw.

3-51. CAROUSEL MOTOR ADJUSTMENT

3-52. The carousel motor adjustment provides the means for positioning the carousel for a proper pen pick when the pen holder enters the stable to pick a pen. This procedure should be performed whenever the carousel motor is replaced or pen picking problems occur. To perform the carousel motor adjustment procedure, proceed with the following steps:

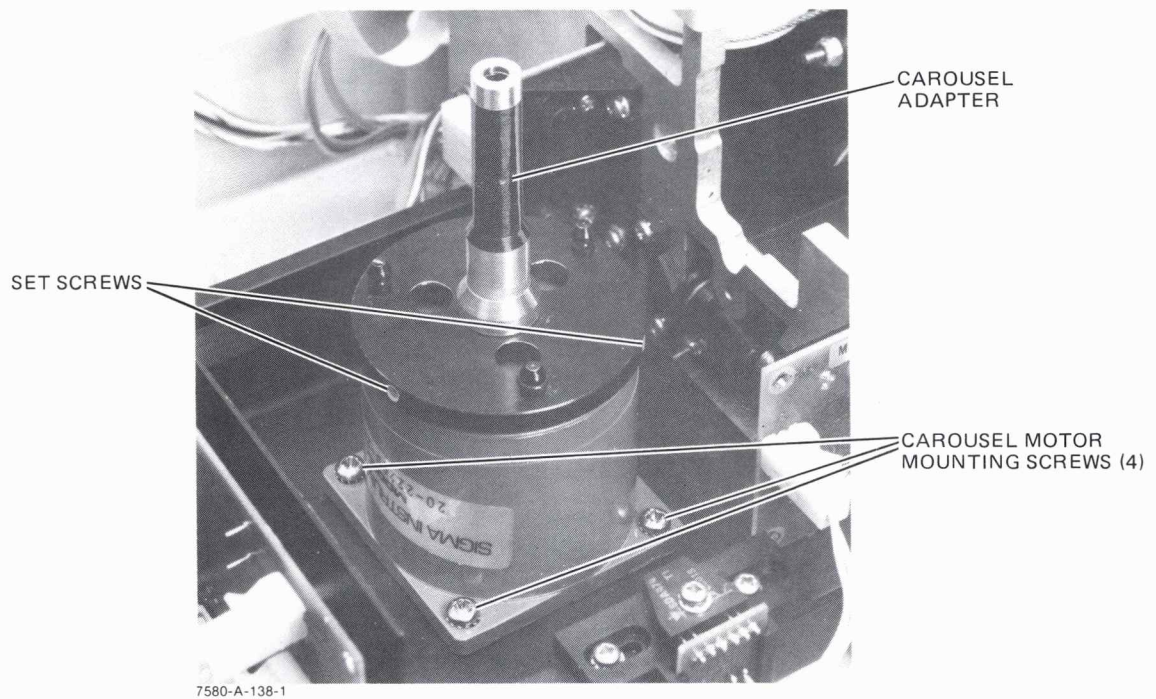
- a. Turn the plotter OFF.
- b. Remove the carousel cover.
- c. Loosen the four carousel motor mounting screws. See Figure 3-14, Detail A.
- d. Loosen the two carousel adaptor setscrews and remove the adaptor. See Figure 3-14, Detail A.

- e. Manually position the carousel motor to the extreme left-hand limit of travel.
- f. Turn the plotter ON. After the plotter has completed the initialization sequence, insert the carousel alignment fixture, HP part number 07580-60208, into the pen holder. See Figure 3-14, Detail B.
- g. Manually position the carousel motor to the right until the motor shaft sets firmly into the notch of the alignment fixture. See Figure 3-14, Detail B.
- h. Tighten the four carousel motor mounting screws.
- i. Turn the plotter OFF. Remove the alignment fixture.
- j. Install the carousel adaptor, but do not tighten the setscrews.
- k. Perform the pen carousel height and initialization sensor adjustment procedure described in this section.

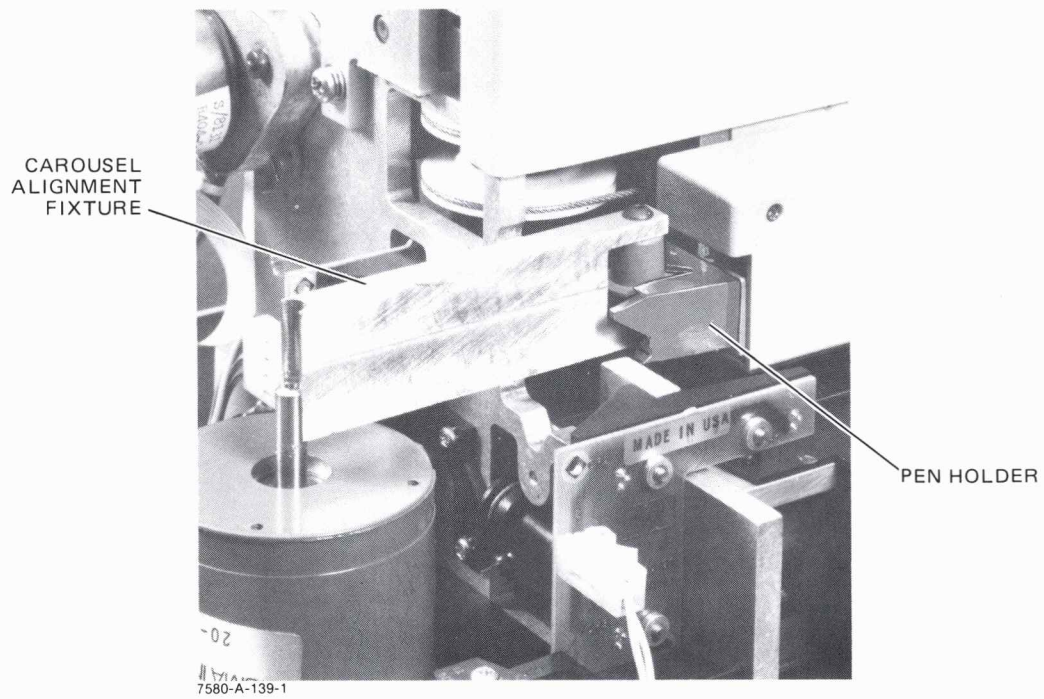
3-53. PEN CAROUSEL HEIGHT AND INITIALIZATION SENSOR ADJUSTMENTS

3-54. The pen carousel height and initialization sensor adjustments are performed as follows:

- a. Turn the plotter OFF.



DETAIL A



DETAIL B

Figure 3-14. Carousel Motor Adjustment

- b. Remove the carousel cover, front table, and front cover. If necessary, refer to the procedure on Opening up the Plotter given in this section.
- c. Remove the pen carousel and loosen the two pen carousel adaptor setscrews. See Figure 3-15, Detail A.
- d. Make sure the carriage cover is lowered into the closed position.
- e. Turn the plotter ON.
- f. Select Calibration Test 3 described earlier in this section.
- g. Press any front-panel pushbutton once.
- h. Turn the X- and Y-motor mute switches S2 and S3 on the X- and Y-Axis Servo PCA to the OFF position.
- i. Insert a pen into stable #1 of the pen carousel and install the carousel in the plotter.
- j. Manually rotate the pen carousel so that pen stable #1 is positioned for a pen pick.
- k. Raise the carriage cover.
- l. Manually move the pen holder into the carousel until the pen holder *just* touches the carousel top plate. See Figure 3-15, Detail B.
- m. The bottom surface of the carousel top plate should touch the pen holder at approximately midpoint on the rising edge of the pen holder. See Figure 3-15, Detail B. Rotate the adjustment screw in the pen carousel adaptor spindle clockwise (CW) to raise the adaptor or counterclockwise (CCW) to lower the adaptor. See Figure 3-15, Detail A.
- n. Manually move the pen holder in to pick the pen in stable #1 and leave in the stable.
- o. One of the two carousel adaptor setscrews should be accessible for tightening. If so, tighten the setscrew while keeping the carousel stationary. See Figure 3-15, Detail C. If neither of the setscrews is accessible, move the pen holder out of the stable, lift the carousel off the adaptor and rotate it 120° and reset on the adaptor. Then repeat step n. and step o.
- p. Move the pen holder out of the pen stable.
- q. Lower the carriage cover into the closed position.
- r. Press any front-panel pushbutton once. The carousel will rotate to the carousel sensor adjustment position.
- s. Loosen the two carousel initialization sensor assembly locking screws. See Figure 3-15, Detail C.
- t. Manually move the carousel initialization sensor assembly to the right until the front panel OUT OF LIMIT lamp *just* turns OFF.
- u. Tighten the carousel initialization sensor assembly locking screws.

- v. Tighten the remaining carousel adaptor setscrew.

3-55. PEN HOLDER ADJUSTMENT

3-56. The pen holder adjustment is designed to ensure that the plotting area remains completely on the media when in the EXPAND mode of operation. This adjustment should be performed whenever the pen carriage or pen holder assemblies are replaced or the plot exceeds the media edges. To perform the pen holder adjustment, proceed as follows:

- a. Set the EXPAND/NORMAL switch on the Rear Panel PCA to the EXPAND position.
- b. Turn the plotter ON. Load a sheet of paper into the plotter and invoke the CONFIDENCE TEST. If necessary, refer to Section II for information on invoking the confidence test procedure. It is not necessary to run the entire confidence test plot, but the entire frame of the plot should be completed. Raising the carriage cover will suspend the plot.
- c. The entire frame of the confidence test plot should be on the paper and parallel to the paper edge. Parallelism may be obtained by performing the paper stop adjustment described earlier in this section. If the frame of the plot is not completely on the paper, approximate the distance of the frame is off and perform the remaining steps in this procedure.
- d. Turn the plotter OFF.
- e. Remove the front-panel cover, carousel cover, and carriage cover.
- f. Manually move the pen carriage toward the left end of the Y-arm until it is positioned in front of the cutout in the trailing cable channel.
- g. Disconnect the trailing cable from the Sensor Interconnect PCA and remove the cable from the two clamps securing it to the channel.
- h. Remove the pen holder cover.
- i. Remove the two screws securing the pen carriage to the drive cable bracket. See Figure 3-16, Detail A.
- j. Compress the two pinch roller springs which apply pressure to the two bearing pivots on top of the carriage. See Figure 3-16, Detail B. Rotate the carriage forward and off the Y-arm.
- k. Loosen the rear pen holder mounting screw. See Figure 3-16, Detail C.
- l. Remove the two screws securing the side cover of the pen carriage. See Figure 3-16, Detail D. Carefully separate the side cover from the pen carriage so as to avoid damaging the flex cable. Do not disturb the alignment of the pen lift photo sensors and flag mechanism.

(Continued on page 3-33)

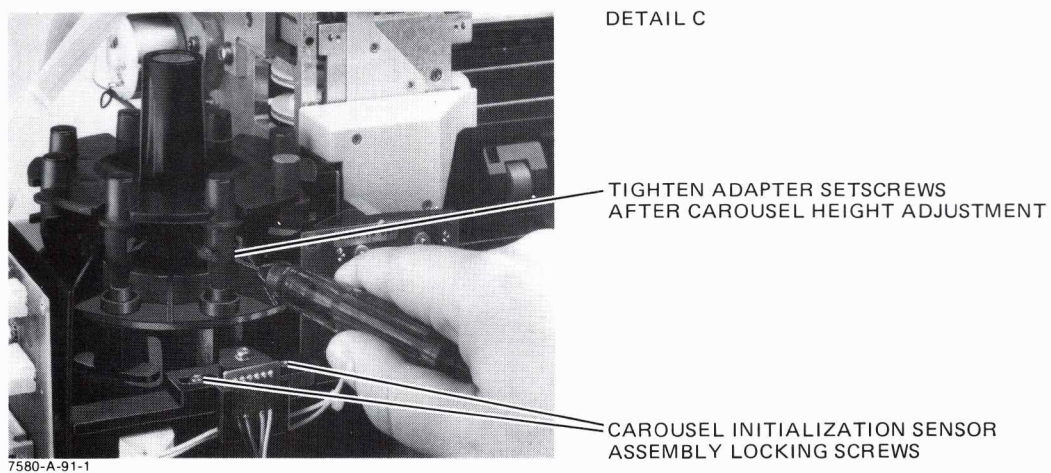
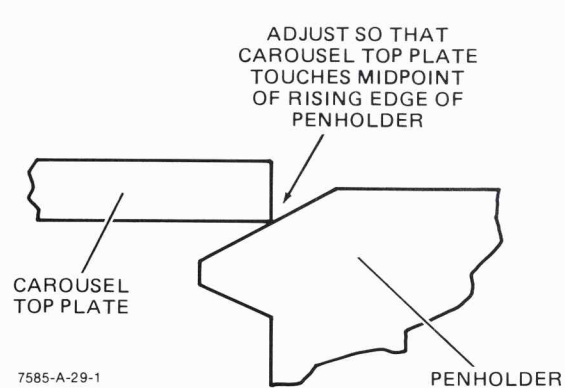
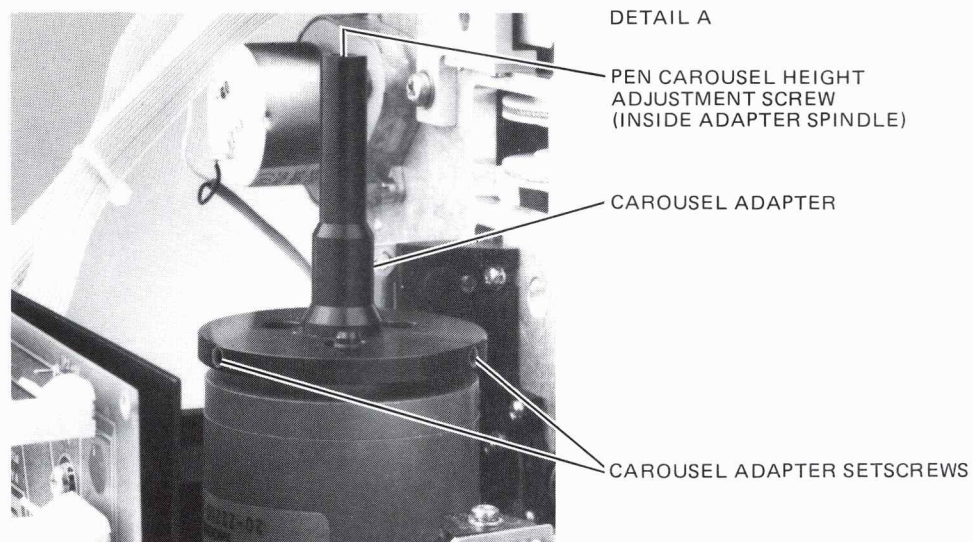


Figure 3-15. Pen Carousel Height and Initialization Sensor Adjustments

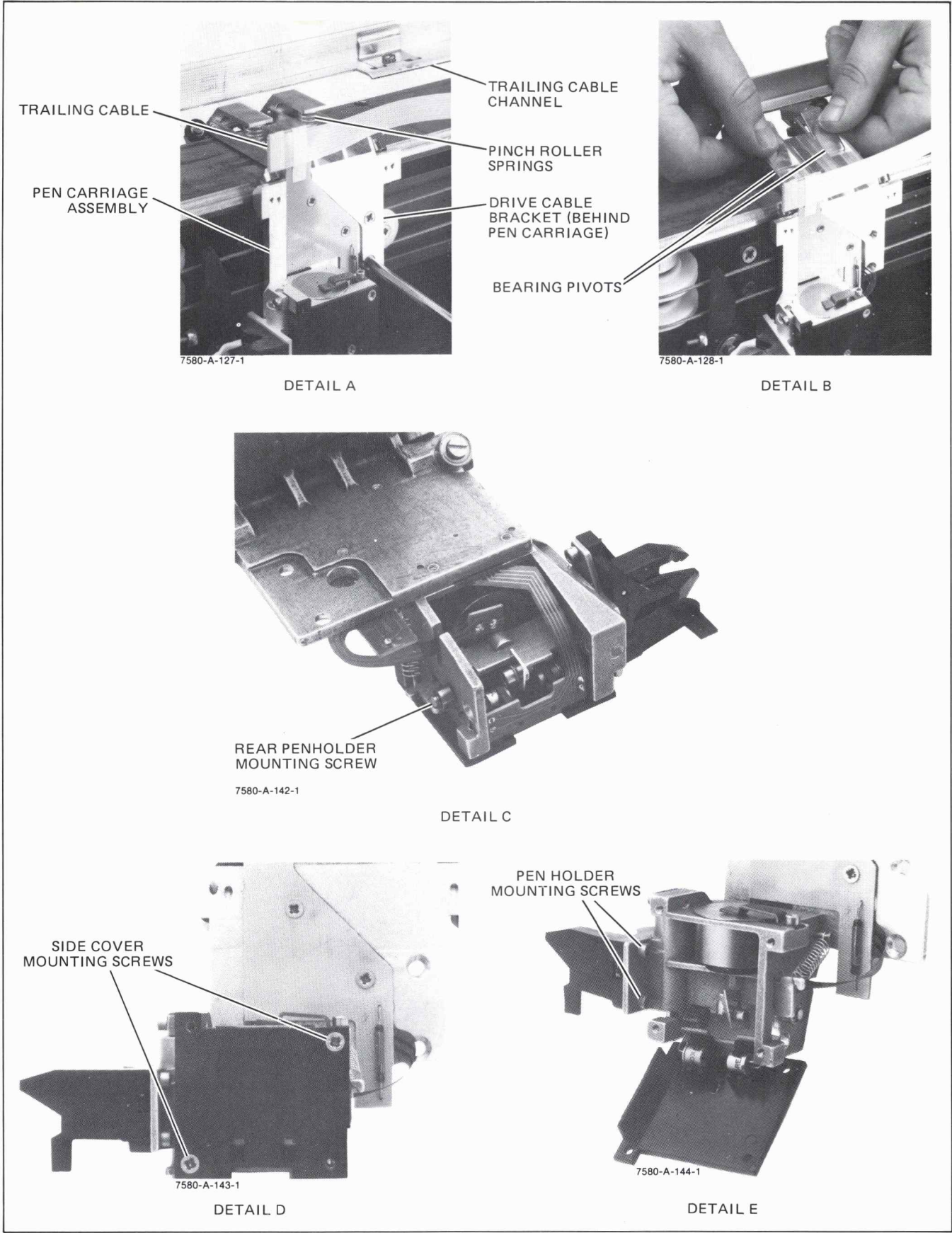


Figure 3-16. Pen Holder Adjustment

- m. Loosen the two remaining pen holder mounting screws. See Figure 3-16, Detail E.
- n. Reposition the pen holder the distance estimated in step c. above and tighten the mounting screws.
- o. Install the side cover on the pen carriage.
- p. Tighten the rear pen holder mounting screws.
- q. Compress the two pinch roller springs and install the pen carriage on the left end of the Y-arm. Make sure the compression springs snap into place in the recesses of the carriage and bearing pivots.
- r. Align the pen carriage with the drive cable bracket and install the two mounting screws.
- s. Manually move the pen carriage to its right-hand limit of travel and insert the trailing cable into the two clamps on the trailing cable channel. Enough slack should be left between the right-hand clamp and the carriage to allow free movement of the cable without binding.
- t. Insert the trailing cable onto the Main Interconnect PCA.
- u. Install the pen carriage cover.
- v. Set the EXPAND/NORMAL switch on the Rear Panel PCA to the NORMAL position.
- w. Perform the Stable Cup Fork Adjustment procedure described in this section.
- f. While pressing the spacer down and flush against the sideplate, axially position the cam assembly such that the microswitch actuator is centered on the cam. See Figure 3-17, Detail A. Tighten the cam assembly setscrew.
- g. Manually rotate the pinch wheel camshaft until the pinch wheel microswitch cam lobe is approximately centered facing the switch and in a line parallel to the near edge of the microswitch spacer. See Figure 3-17, Detail B.
- h. While pressing the microswitch spacer down and flush against the sideplate, slide the spacer toward the cam assembly until the microswitch *just* closes. Tighten the spacer mounting screws.
- i. Manually rotate the pinch wheel camshaft clockwise (top to bottom towards you) to make sure that the switch does not bind against the cam assembly. If binding occurs, readjust the spacer.
- j. Manually rotate the pinch wheel camshaft until the pinch wheels are fully raised to the up position.
- k. Loosen the pinch wheel microswitch cam assembly setscrew until the cam assembly is *just* free to rotate.
- l. Rotate the cam assembly until the setscrew is positioned at the top of the camshaft and facing straight up. Position the cam assembly such that the microswitch is *just* ready to activate. Tighten the cam assembly setscrew. See Figure 3-17, Detail C.

3-57. PINCH WHEEL ADJUSTMENT

3-58. The pinch wheel adjustment provides proper orientation of the pinch rollers in the up or down position with relationship to the setting of the pinch wheel cam and microswitch. To perform the pinch wheel adjustment, proceed as follows:

- a. Turn the plotter OFF.
- b. Remove the front panel and carousel covers. Remove the carriage cover. If necessary, refer to the procedure on Opening up the Plotter given in this section.
- c. Remove the pen carriage trailing cable channel.
- d. Using a 1/16-inch Allen wrench, loosen the pinch wheel microswitch cam assembly setscrew until the cam assembly is *just* free to rotate. See Figure 3-17, Detail A.
- e. Loosen the two pinch wheel microswitch spacer mounting screws until the spacer is *just* free to move. See Figure 3-17, Detail B.

NOTE

If a new microswitch is installed, make sure the switch is installed with the switch actuator towards the bottom edge of the microswitch spacer.

3-59. CARRIAGE COVER INTERLOCK MICROSWITCHES ADJUSTMENT

3-60. The carriage cover microswitches are adjusted to insure that operation of the plotter is intervened if the carriage cover is raised. The primary and supplementary carriage cover interlock microswitches are adjusted as follows:

- a. Turn the plotter OFF.
- b. Remove the front panel and carousel covers. Remove the carriage cover. If necessary, refer to the procedure on Opening up the Plotter given in this section.
- c. Invert the carriage cover and place it on a flat surface to access the interlock microswitches and assure the cover is in the closed position.
- d. Loosen the primary carriage cover interlock microswitch mounting screws. See Figure 3-18.
- e. Pivot the primary microswitch against the microswitch actuator until the switch closes. See Figure 3-18.
- f. Tighten the microswitch mounting screws.
- g. Perform steps d. through f. of this procedure for the supplementary carriage cover interlock microswitch.

DETAIL A

PINCH WHEEL
MICROSWITCH CAM
ASSEMBLY
(INCLUDES CAM
AND CAM COLLAR)

MICROSWITCH CAM
ASSEMBLY SETSCREW

CAM LATERALLY
CENTERED ON
MICROSWITCH
ACTUATOR

7585-A-25-1

DETAIL B

CAM LOBE
CENTERED ON
MICROSWITCH
ACTUATOR AND
PARALLEL WITH
INSIDE EDGE
OF SPACER

PINCH WHEEL
MICROSWITCH
SPACER

SPACER
MOUNTING
SCREWS

7585-A-26-1

DETAIL C

MICROSWITCH CAM
ASSEMBLY SETSCREW

CAM POSITIONED
TO JUST START
MICROSWITCH
ACTIVATION

7585-A-27-1

Figure 3-17. Pinch Wheel Adjustment

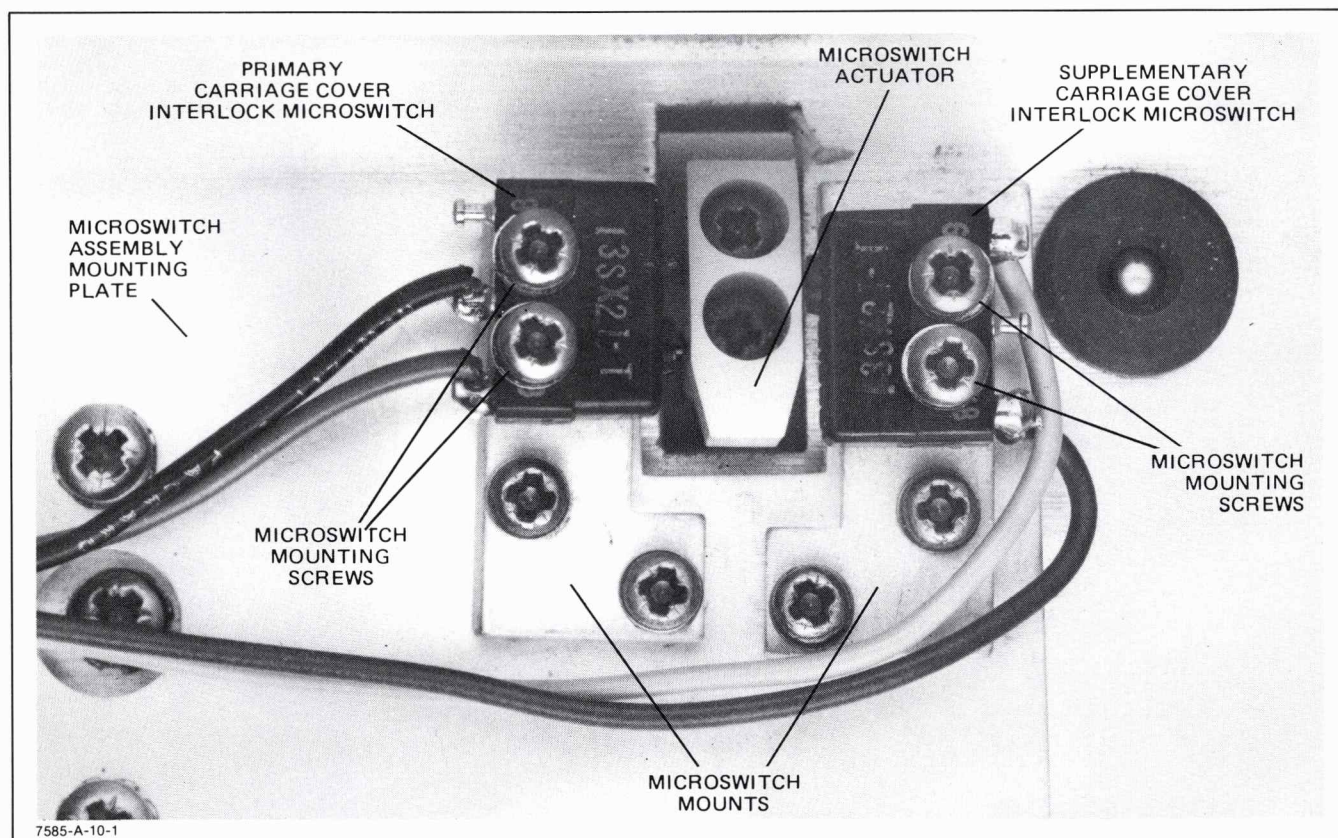


Figure 3-18. Carriage Cover Interlock Microswitches Adjustment

3-61. PEN CAP ACTUATING LEVER ADJUSTMENT

3-62. This adjustment is designed to assure that the pen capping mechanism properly uncaps the pen for a pen pick and pen insertion into the carousel.

3-63. To perform the Pen Cap Actuating Lever Adjustment, refer to Figure 3-10, Detail B and perform the following steps:

- a. Turn the plotter LINE switch to OFF and disconnect the ac power cord.
- b. Remove the Carousel (L.H.) Cover. If necessary, refer to the procedure on Opening Up the Plotter given in this section.
- c. Raise the carriage cover and remove the pen carriage cover.
- d. Manually move the pen carriage left until the pen carriage plate contacts the pen cap actuating lever. The plate should fully contact the lever. If the lever is not centered for full contact with the plate, perform the remaining steps.
- e. Using a 3/32 inch Allen wrench, loosen the Pen Cap Actuating Lever set screw accessible from the back side of the actuating lever mounting block.
- f. Using a small common screwdriver, rotate the Actuating Lever adjustment screw clockwise (cw) to move the lever backward (in) or counterclockwise (ccw) to move the lever forward (out) until centered with the plate.
- g. Tighten the locking set screw.
- h. Manually check the pen capping mechanism for proper operation and repeat if necessary.

SECTION IV

REPLACEABLE PARTS

4-1. INTRODUCTION

4-2. This section contains parts information for the Model 7580B Plotter. Included herein is a listing of assemblies, replaceable parts, and ordering information. Table 4-1 is a list of exchange assemblies, and Table 4-2 lists reference designations and abbreviations used throughout this manual. Tables 4-3 through 4-20 list all replaceable parts in assembly number sequence and/or reference designator order. Table 4-21 contains the names and addresses that correspond to the manufacturer's code numbers.

4-3. Parts lists for the HP-IB/RS-232-C (Dual I/O) Interface and Rear Panel PCAs are contained in Appendix A at the back of this manual.

4-4. EXCHANGE ASSEMBLIES

4-5. Factory rebuilt assemblies that can be exchanged are listed in Table 4-1. Exchange, factory repaired and tested, assemblies are available only on a trade-in basis; therefore, the defective assemblies must be returned for credit.

4-6. REFERENCE DESIGNATIONS AND ABBREVIATIONS

4-7. Table 4-2 lists reference designations and abbreviations used throughout this manual. Abbreviations in the parts lists are always capital letters. In other parts of the manual, both upper- and lowercase abbreviations are used.

4-8. REPLACEABLE PARTS LISTS

4-9. The lists of replaceable parts are organized such that printed circuit assemblies (PCAs) and their components are listed in alphanumeric order by reference designation. Mechanical parts are listed in order by number-keyed designations corresponding to the illustrated parts breakdown diagrams in this section. The information given for each part consists of the Hewlett-

Packard part number, the quantity used in the plotter, the part description, and the manufacturer's code number. The total quantity for each part is given only once, at the first appearance of the part number in the list.

4-10. PRINTED CIRCUIT ASSEMBLIES

4-11. Parts located on printed circuit assemblies (PCAs) are listed in Tables 4-3 through 4-15. These tables are in assembly number sequence. The components on each PCA are listed in alphanumeric order by reference designation.

4-12. CABLE ASSEMBLIES

4-13. Interconnecting cable assemblies with their respective part numbers are illustrated in Figure 4-1. Use the part number and assembly name when ordering the cable assemblies.

4-14. MECHANICAL ASSEMBLIES

4-15. Mechanical assemblies and frame mounted parts are listed in Tables 4-16 through 4-20 and illustrated in Figures 4-2 through 4-6. Match the appropriate parts list and illustrated parts breakdown diagram for part identification.

4-16. CODE LIST OF MANUFACTURERS

4-17. Table 4-21 lists the five-digit code numbers assigned to the manufacturers of parts in the HP Model 7580B Drafting Plotter. These code numbers appear with the parts in the Replaceable Parts Lists in this section as an aid for ordering replacement parts directly from the manufacturer.

4-18. ORDERING INFORMATION

4-19. To obtain replacement parts or assemblies, address an order or inquiry to the nearest Hewlett-Packard Sales and Support Office. The order should include the part or assembly number, its description and location, and the plotter model and serial number.

Table 4-1. Parts List, Exchange Assemblies — Model 7580B

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A3 A5 A6	07585-66013	9	1	PEN CARTRIDGE ASSEMBLY, REBUILT	28480	07585-66013
	07585-66369	8	1	PROCESSOR PCA, REBUILT	28480	07585-66369
	07585-66261	9	1	INTERNAL I/O PCA, REBUILT	28480	07585-66261
	07580-66107	7	1	X AND Y AXIS SERVO PCA, REBUILT	28480	07580-66107
	07580-66104	4	1	POWER SUPPLY ASSEMBLY, REBUILT	28480	07580-66104
				NOTE REBUILT ASSEMBLY PART NUMBERS HAVE A -60XXX SUFFIX. NEW ASSEMBLIES HAVE A -60XXX SUFFIX.		

Table 4-2. Reference Designations and Abbreviations

REFERENCE DESIGNATIONS

A.....assembly	E.....miscellaneous electrical part	P.....electrical connector (movable portion); plug	V.....electron tube
AT.....attenuator; isolator; termination	F.....fuse	Q.....transistor; SCR; triode thyristor	VR.....voltage regulator; breakdown diode
B.....fan; motor	FL.....filter	R.....resistor	W.....cable; transmission path; wire
BT.....battery	H.....hardware	RT.....thermistor	X.....socket
C.....capacitor	HY.....circulator	S.....switch	Y.....crystal unit (piezo-electric or quartz)
CP.....coupler	J.....electrical connector (stationary portion)	T.....transformer	Z.....tuned cavity; tuned circuit
CR.....diode; diode thyristor; varactor	jack	TB.....terminal board	
DC.....directional coupler	K.....relay	TC.....thermocouple	
DL.....delay line	L.....coil; inductor	TP.....test point	
DS.....annunciator; signaling device (audible or visual); lamp; LED	M.....meter	U.....integrated circuit; microcircuit	
	MP.....miscellaneous mechanical part		

ABBREVIATIONS

A.....ampere	COEF.....coefficient	ELECT.....electrolytic	kg.....kilogram
ac.....alternating current	COM.....common	ENCAP.....encapsulated	kHz.....kilohertz
ACCESS.....accessory	COMP.....composition	EXT.....external	k Ωkilohm
ADJ.....adjustment	COMPL.....complete	F.....farad	kV.....kilovolt
A/D.....analog-to-digital	CONN.....connector	FET.....field-effect transistor	lb.....pound
AF.....audio frequency	CP.....cadmium plate	F/F.....flip flop	LC.....inductance-capacitance
AFC.....automatic frequency control	CRT.....cathode-ray tube	FH.....flat head	LED.....light-emitting diode
AGC.....automatic gain control	CTL.....complementary transistor logic	FIL H.....fillister head	LF.....low frequency
AL.....aluminum	CW.....continuous wave	FM.....frequency modulation	LG.....long
ALC.....automatic level control	cm.....centimetre	FP.....front panel	LH.....left hand
AM.....amplitude modulation	D/A.....digital-to-analog	FREQ.....frequency	LIM.....limit
AMPL.....amplifier	dB.....decibel	FXD.....fixed	LIN.....linear taper (used in parts list)
APC.....automatic phase control	dBm.....decibel referred to 1 mW	g.....gram	lin.....linear
ASSY.....assembly	dc.....direct current	GE.....germanium	LK WASH.....lock washer
AUX.....auxiliary	deg.....degree (temperature interval) or difference	GHz.....gigahertz	LO.....low; local oscillator
avg.....average	°.....degree (plane angle)	GL.....glass	LOG.....logarithmic taper (used in parts list)
AWG.....American wire gauge	°C.....degree Celsius (centigrade)	GRD.....ground(ed)	log.....logarithm(ic)
BAL.....balance	°F.....degree Fahrenheit	H.....henry	LPF.....low pass filter
BCD.....binary coded decimal	°K.....degree Kelvin	h.....hour	LV.....low voltage
BD.....board	DEPC.....deposited carbon	HET.....heterodyne	m.....metre (distance)
BE CU.....beryllium copper	DET.....detector	HEX.....hexagonal	mA.....milliampere
BFO.....beat frequency oscillator	diam.....diameter	HD.....head	MAX.....maximum
BH.....binder head	DIA.....diameter (used in parts list)	HDW.....hardware	M Ωmegohm
BKDN.....breakdown	DIFF AMPL.....differential amplifier	HF.....high frequency	MEG.....meg (10 ⁶) (used in parts list)
BP.....bandpass	div.....division	HP.....Hewlett-Packard	MET FLM.....metal film
BPF.....bandpass filter	DPDT.....double-pole, double-throw	HPF.....high pass filter	MET OX.....metallic oxide
BRS.....brass	DR.....drive	HR.....hour (used in parts list)	MF.....medium frequency; microfarad (used in parts list)
BWO.....backward-wave oscillator	DSB.....double sideband	HV.....high voltage	MFR.....manufacturer
CAL.....calibrate	DTL.....diode transistor logic	Hz.....Hertz	mg.....milligram
ccw.....counter-clockwise	DVM.....digital voltmeter	IC.....integrated circuit	MHz.....megahertz
CER.....ceramic	ECL.....emitter coupled logic	ID.....inside diameter	mH.....millihenry
CHAN.....channel	EMF.....electromotive force	IF.....intermediate frequency	mho.....mho
cm.....centimetre	EDP.....electronic data processing	IMPG.....impregnated	MIN.....minimum
CMO.....cabinet mount only		in.....inch	min.....minute (time)
COAX.....coaxial		INCD.....incandescent	'.....minute (plane angle)
		INCL.....include(s)	MINAT.....miniature
		INP.....input	mm.....millimetre
		INS.....insulation	MOD.....modulator
		INT.....internal	

NOTE

All abbreviations in the parts list will be in upper-case.

Table 4-2. Reference Designations and Abbreviations (Continued)

MOM..... momentary	ns nanosecond	PWN..... pulse-width	SST stainless steel
MOS metal-oxide	nW nanowatt	modulation	STL..... steel
semiconductor	OBD..... order by description	PWV..... peak working	SQ..... square
ms millisecond	OD outside diameter	voltage	SWR standing-wave ratio
MTG mounting	OH oval head	RC resistance-	SYNC..... synchronize
MTR meter	OP AMPL operational	capacitance	T timed (slow-blow fuse)
(indicating device)	amplifier	RECT..... rectifier	TA..... tantalum
mV millivolt	OPT option	REF reference	TC temperature
mVac..... millivolt, ac	OSC oscillator	REG..... regulated	coefficient
mVdc..... millivolt, dc	OX oxide	REPL..... replaceable	TD time delay
mVpk..... millivolt, peak	oz ounce	RF..... radio frequency	TERM..... terminal
mVp-p..... millivolt,	Ω ohm	RFI radio frequency	TFT..... thin-film transistor
peak-to-peak	P peak	interference	TGL toggle
mVrms millivolt, rms	(used in parts list)	RH round head;	THD thread
mW milliwatt	PAM pulse-amplitude	right hand	THRU..... through
MUX..... multiplex	modulation	RLC resistance-	TI titanium
MY..... mylar	PC..... printed circuit	inductance-	TOL tolerance
μ A microampere	PCM pulse-code-	capacitance	TRIM..... trimmer
μ F microfarad	modulation; pulse-count	RMO..... rack mount only	TSTR..... transistor
μ H microhenry	modulation	rms root-mean-square	TTL..... transistor
μ mho..... micromho	PDM..... pulse-duration	RND round	logic
μ s microsecond	modulation	ROM..... read only memory	U micro (10^{-6})
μ V microvolt	pF picofarad	R & P..... rack and panel	(used in parts list)
μ Vac..... microvolt, ac	PIV peak inverse voltage	RWV..... reverse working	UF..... microfarad
μ Vdc..... microvolt, dc	pk peak	voltage	(used in parts list)
μ Vpk..... microvolt, peak	PNP positive-negative-	S..... scattering parameter	UHF..... ultrahigh frequency
μ Vp-p..... microvolt,	positive	s second (time)	UNREG..... unregulated
peak-to-peak	P/O..... part of	" second	V volt
μ Vrms microvolt, rms	POLY..... polystyrene	(plane angle)	VA voltampere
μ W microwatt	PORC porcelain	S-B slow-blow (fuse)	Vac..... volts, ac
nA nanoampere	POS positive; position(s)	(used in parts list)	VAR..... variable
NC no connection	(used in parts list)	SCR silicon controlled	Vdc..... volts, dc
N/C..... normally closed	POSN..... position	rectifier; screw	VDCW..... volts, dc, working
NEG..... negative	POT potentiometer	SE selenium	(used in parts list)
nF nanofarad	p-p..... peak-to-peak	SECT sections	Vpk volts, peak
NI PL..... nickel plate	PP peak-to-peak	SEMICON semiconductor	Vp-p volts, peak-to-peak
N/O normally open	(used in parts list)	SHF superhigh frequency	Vrms volts, rms
NOM..... nominal	PPM pulse-position	SI silicon	VTVM..... vacuum-tube
NORM..... normal	modulation;	SIL silver	voltmeter
NPN..... negative-positive-	parts per million	SL slide	V(X) volts, switched
negative	PREAMPL..... preamplifier	SNR signal-to-noise ratio	W watt
NPO..... negative-positive	PRF pulse-repetition	SPDT..... single-pole,	W/ with
zero (zero temperature	frequency	double-throw	WIV working inverse
coefficient)	PRR..... pulse repetition rate	SPG spring	voltage
NRFR..... not recommended	ps picosecond	SR split ring	WW..... wirewound
for field replacement	PT point	SPST..... single-pole,	W/O..... without
NSR not separately	PTM pulse-time	single-throw	Z characteristic
replaceable	modulation	SSB..... single sideband	impedance

NOTE

All abbreviations in the parts list will be in upper-case.

MULTIPLIERS

Abbreviation	Prefix	Multiple
T	tera	10^{12}
G	giga	10^9
M	mega	10^6
k	kilo	10^3
da	deka	10
d	deci	10^{-1}
c	centi	10^{-2}
m	milli	10^{-3}
μ	micro	10^{-6}
n	nano	10^{-9}
p	pico	10^{-12}
f	femto	10^{-15}
a	atto	10^{-18}

Table 4-3. Parts List, Processor PCA (A3) — Model 7580B

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A3	07585-60369	6	1	PCA-PROCESSOR	28480	07585-60369
A3C1	0160-3847	9	37	CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
A3C2	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
A3C3	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
A3C4	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
A3C5	0180-0228	6	1	CAPACITOR-FXD 22UF+-10% 15VDC TA	56289	150D226X9015B2
A3C6- A3C38	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
A3DS1	1990-0993	0	2	LED-LAMP ARRAY	28480	1990-0993
A3DS2	1990-0993	0		LED-LAMP ARRAY	28480	1990-0993
A3J1	1251-8170	5	1	CONN-POST TYPE .100-PIN-SPCG 2-CONT	28480	1251-8170
A3J2	1251-6515	8	1	CONNECTOR 6-PIN M POST TYPE	28480	1251-6515
A3R1	0683-2225	3	1	RESISTOR 2.2K 5% .25W FC TC=-400/+700	01121	CB2225
A3R2	0683-4725	2	1	RESISTOR 4.7K 5% .25W FC TC=-400/+700	01121	CB4725
A3RN1	1810-0279	5	3	NETWORK-RES 10-SIP4.7K OHM X 9	01121	210A472
A3RN2	1810-0279	5		NETWORK-RES 10-SIP4.7K OHM X 9	01121	210A472
A3RN3	1810-0279	5		NETWORK-RES 10-SIP4.7K OHM X 9	01121	210A472
A3RN4	1810-0272	8	1	NETWORK-RES 10-SIP330.0 OHM X 9	01121	210A331
A3S1	3101-2094	5	1	SWITCH-RKR DIP-RKR-ASSY 8-1A .05A 30VDC	28480	3101-2094
A3S2	3101-2170	8	1	SWITCH-PB SPDT MOM	28480	3101-2170
A3U1	1818-3022	8	12	IC CMOS 16384 (16K) STAT RAM 200-NS	28480	1818-3022
A3U2	1818-3022	8		IC CMOS 16384 (16K) STAT RAM 200-NS	28480	1818-3022
A3U3	07585-18040	1	1	IC NMOS 131072 (128K) EPROM 300-NS 3-S	28480	07585-18040
A3U4	07585-18041	2	1	IC NMOS 131072 (128K) EPROM 300-NS 3-S	28480	07585-18041
A3U5	1820-1216	3	3	IC DCDR TTL LS 3-TO-8-LINE 3-INP	01295	SN74LS138N
A3U6	1820-1918	2	1	IC BFR TTL LS LINE DRVR OCTL	01295	SN74LS241N
A3U7	1820-2075	4	4	IC TRANSCEIVER TTL LS BUS OCTL	28480	1820-2075
A3U8	1820-2075	4		IC TRANSCEIVER TTL LS BUS OCTL	28480	1820-2075
A3U9	1818-3022	8		IC CMOS 16384 (16K) STAT RAM 200-NS	28480	1818-3022
A3U10	1818-3022	8		IC CMOS 16384 (16K) STAT RAM 200-NS	28480	1818-3022
A3U11	1818-3320	9	2	IC NMOS 131072 (128K) EPROM 250-NS 3-S	28480	1818-3320
A3U12	1818-3320	9		IC NMOS 131072 (128K) EPROM 250-NS 3-S	28480	1818-3320
A3U13	1820-2244	9	1	IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	SN74LS379N
A3U14	1820-2711	5	2	IC DRVR TTL LS LINE DRVR OCTL	01295	SN74LS541N
A3U15	1820-2075	4		IC TRANSCEIVER TTL LS BUS OCTL	28480	1820-2075
A3U16	1820-2075	4		IC TRANSCEIVER TTL LS BUS OCTL	28480	1820-2075
A3U17	1818-3022	8		IC CMOS 16384 (16K) STAT RAM 200-NS	28480	1818-3022
A3U18	1818-3022	8		IC CMOS 16384 (16K) STAT RAM 200-NS	28480	1818-3022
A3U19	07585-18043	4	1	IC NMOS 131072 (128K) EPROM 300-NS 3-S	28480	07585-18043
A3U20	07585-18042	3	1	IC NMOS 131072 (128K) EPROM 300-NS 3-S	28480	07585-18042
A3U21	1820-1198	0	1	IC GATE TTL LS NAND QUAD 2-INP	01295	SN74LS03N
A3U22	1813-0365	6	1	XTAL-CLOCK-OSCILLATOR 8.0-MHZ TTL METAL	28480	1813-0365
A3U23	1820-2553	3	1	IC-MPU; CLK FREQ=4 MHZ, NON-SEGMENTED	28480	1820-2553
A3U24	1818-3022	8		IC CMOS 16384 (16K) STAT RAM 200-NS	28480	1818-3022
A3U25	1818-3022	8		IC CMOS 16384 (16K) STAT RAM 200-NS	28480	1818-3022
A3U26	07586-18045	7	1	IC NMOS 131072 (128K) EPROM 300-NS 3-S	28480	07586-18045
A3U27	07586-18044	6	1	IC NMOS 131072 (128K) EPROM 300-NS 3-S	28480	07586-18044
A3U28	1820-1917	1	1	IC BFR TTL LS LINE DRVR OCTL	01295	SN74LS240N
A3U29	1820-1112	8	1	IC FF TTL LS D-TYPE POS-EDGE-TRIG	01295	SN74LS74AN
A3U30	1818-3022	8		IC CMOS 16384 (16K) STAT RAM 200-NS	28480	1818-3022
A3U31	1818-3022	8		IC CMOS 16384 (16K) STAT RAM 200-NS	28480	1818-3022
A3U32	07586-18047	9	1	IC NMOS 131072 (128K) EPROM 300-NS 3-S	28480	07586-18047
A3U33	07586-18046	8	1	IC NMOS 131072 (128K) EPROM 300-NS 3-S	28480	07586-18046
A3U34	1820-1491	9	1	IC BFR TTL LS NON-INV HEX 1-INP	01295	SN74LS367AN
A3U35	1820-1197	9	3	IC GATE TTL LS NAND QUAD 2-INP	01295	SN74LS00N
A3U36	1820-2996	8	1	IC PRGMBL-LGC TTL S PAL	28480	1820-2996
A3U37	1818-3022	8		IC CMOS 16384 (16K) STAT RAM 200-NS	28480	1818-3022
A3U38	1818-3022	8		IC CMOS 16384 (16K) STAT RAM 200-NS	28480	1818-3022
A3U39	1820-1197	9		IC GATE TTL LS NAND QUAD 2-INP	01295	SN74LS00N
A3U40	1820-1201	6	1	IC GATE TTL LS AND QUAD 2-INP	01295	SN74LS08N
A3U41	1820-2102	8	2	IC LCH TTL LS D-TYPE OCTL	01295	SN74LS373N
A3U42	1820-2102	8		IC LCH TTL LS D-TYPE OCTL	01295	SN74LS373N
A3U43	1820-2711	5		IC DRVR TTL LS LINE DRVR OCTL	01295	SN74LS541N
A3U44	1820-1858	9	1	IC FF TTL LS D-TYPE OCTL	01295	SN74LS377N
A3U45	1820-1216	3		IC DCDR TTL LS 3-TO-8-LINE 3-INP	01295	SN74LS138N
A3U46	1820-1197	9		IC GATE TTL LS NAND QUAD 2-INP	01295	SN74LS00N
A3U47	1820-1216	3		IC DCDR TTL LS 3-TO-8-LINE 3-INP	01295	SN74LS138N
A3W1	1258-0189	4	3	JUMPER-REMOVABLE FOR 0.025 IN SQUARE	28480	1258-0189
A3W2	1258-0189	4		JUMPER-REMOVABLE FOR 0.025 IN SQUARE	28480	1258-0189
A3W3	1258-0189	4		JUMPER-REMOVABLE FOR 0.025 IN SQUARE	28480	1258-0189

Table 4-3. Parts List, Processor PCA (A3) — Model 7580B (Continued)

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
				MISCELLANEOUS		
	0510-0843	2	2	PIN SPIRAL	28480	0510-0843
	1200-0657	0	10	SOCKET-IC 36-CONT DIP-SLDR	28480	1200-0657
	1200-0654	7	1	SOCKET-IC 40-CONT DIP DIP-SLDR	28480	1200-0654
	1200-1107	7	1	SOCKET DIP 24	28480	1200-1107
	4040-0751	8	2	EXTR-PC BD ORN POLYC .062-BD-THKNS	28480	4040-0751
	1251-0600	0	2	CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600

Table 4-4. Parts List, Front Panel PCA (A4) — Model 7580B

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A4	07585-60264	0	1	FRONT PANEL, PCA	28480	07585-60264
A4C1	0160-3847	9	3	CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
A4C2	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
A4C3	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
A4C4	0180-0130	3	1	CAPACITOR-FXD 4.7UF+-10% 35VDC TA	56289	150D475X9035B2
A4DS1	1990-0521	0	1	LED-LAMP LUM-INT=2.2MCD IF=50MA-MAX	28480	5082-4955
A4DS2	1990-0524	3	3	LED-LAMP LUM-INT=1MCD IF=20MA-MAX BVR=5V	28480	5082-4550
A4DS3	1990-0524	3		LED-LAMP LUM-INT=1MCD IF=20MA-MAX BVR=5V	28480	5082-4550
A4DS4	1990-0524	3	9	LED-LAMP LUM-INT=1MCD IF=20MA-MAX BVR=5V	28480	5082-4550
A4DS5	1990-0487	7		LED-LAMP LUM-INT=1MCD IF=20MA-MAX BVR=5V	28480	5082-4584
A4DS6	1990-0487	7		LED-LAMP LUM-INT=1MCD IF=20MA-MAX BVR=5V	28480	5082-4584
A4DS7	1990-0487	7		LED-LAMP LUM-INT=1MCD IF=20MA-MAX BVR=5V	28480	5082-4584
A4DS8	1990-0487	7		LED-LAMP LUM-INT=1MCD IF=20MA-MAX BVR=5V	28480	5082-4584
A4DS9	1990-0487	7	3	LED-LAMP LUM-INT=1MCD IF=20MA-MAX BVR=5V	28480	5082-4584
A4DS10	1990-0418	4		DISPLAY-AN-DOT MAT 1-CHAR .29-H	28480	5082-7340
A4DS11	1990-0418	4		DISPLAY-AN-DOT MAT 1-CHAR .29-H	28480	5082-7340
A4DS12	1990-0418	4		DISPLAY-AN-DOT MAT 1-CHAR .29-H	28480	5082-7340
A4DS13	1990-0487	7		LED-LAMP LUM-INT=1MCD IF=20MA-MAX BVR=5V	28480	5082-4584
A4DS14	1990-0487	7		LED-LAMP LUM-INT=1MCD IF=20MA-MAX BVR=5V	28480	5082-4584
A4DS15	1990-0487	7		LED-LAMP LUM-INT=1MCD IF=20MA-MAX BVR=5V	28480	5082-4584
A4DS16	1990-0487	7		LED-LAMP LUM-INT=1MCD IF=20MA-MAX BVR=5V	28480	5082-4584
A4J1	1251-3873	5	1	CONNECTOR 4-PIN M POST TYPE	28480	1251-3873
A4J3	1251-7328	3	1	CONNECTOR 2-PIN M POST TYPE	28480	1251-7328
A4R1	0698-3443	0	6	RESISTOR 287 1% .125W F TC=0+-100	24546	C4-1/8-T0-287R-F
A4R2	0698-3443	0		RESISTOR 287 1% .125W F TC=0+-100	24546	C4-1/8-T0-287R-F
A4R3	0698-3443	0		RESISTOR 287 1% .125W F TC=0+-100	24546	C4-1/8-T0-287R-F
A4R4	0698-3443	0		RESISTOR 287 1% .125W F TC=0+-100	24546	C4-1/8-T0-287R-F
A4R5	0698-3443	0		RESISTOR 287 1% .125W F TC=0+-100	24546	C4-1/8-T0-287R-F
A4R6	0698-3443	0		RESISTOR 287 1% .125W F TC=0+-100	24546	C4-1/8-T0-287R-F
A4S1	5060-9436	7	23	PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
A4S2	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
A4S3	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
A4S4	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
A4S5	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
A4S6	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
A4S7	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
A4S8	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
A4S9	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
A4S10	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
A4S11	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
A4S12	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
A4S13	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
A4S14	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
A4S15	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
A4S16	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
A4S17	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
A4S18	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
A4S19	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
A4S20	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
A4S21	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
A4S22	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
A4S23	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
				MISCELLANEOUS PARTS		
	09872-40006	8	3	SPACER-LED	28480	09872-40006
	1200-0938	0	1	SOCKET-IC 28-CONT DIP DIP-SLDR	28480	1200-0938

Table 4-5. Parts List, Internal I/O PCA (A5) — Model 7580B

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A5	07585-60261	7	1	INTERNAL I/O, PCA	28480	07585-60261
ASC1	0160-3847	9	31	CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
ASC2	0180-2866	2	3	CAPACITOR-FXD 22UF+100-10% 50VDC AL	28480	0180-2866
ASC3	0180-0228	6	1	CAPACITOR-FXD 22UF+-10% 15VDC TA	56289	1500226X9015B2
ASC4	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
ASC5	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
ASC6	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
ASC7	0180-2866	2		CAPACITOR-FXD 22UF+100-10% 50VDC AL	28480	0180-2866
ASC8	0180-0585	8	2	CAPACITOR-FXD 47UF+100-10% 15VDC AL	56289	6720476H015BB2C
ASC9	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
ASC10	0180-2866	2		CAPACITOR-FXD 22UF+100-10% 50VDC AL	28480	0180-2866
ASC11	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
ASC12	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
ASC13	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
ASC14	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
ASC15	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
ASC16	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
ASC17	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
ASC18	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
ASC19	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
ASC20	0140-0194	1	1	CAPACITOR-FXD 110PF +-5% 300VDC MICA	72136	DM15F111J0300WV1CR
ASC21	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
ASC22	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
ASC23	0160-0163	6	1	CAPACITOR-FXD .033UF +-10% 200VDC POLYE	28480	0160-0163
ASC24	0170-0066	9	1	CAPACITOR-FXD .027UF +-10% 200VDC POLYE	28480	0170-0066
ASC25	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
ASC26	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
ASC27	0180-1745	4	1	CAPACITOR-FXD 1.5UF+-10% 20VDC TA	56289	150D155X9020A2
ASC28	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
ASC29	0180-0585	8		CAPACITOR-FXD 47UF+100-10% 15VDC AL	56289	6720476H015BB2C
ASC30	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
ASC31	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
ASC32	0160-0153	4	6	CAPACITOR-FXD 1000PF +-10% 200VDC POLYE	28480	0160-0153
ASC33	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
ASC34	0160-0162	5	1	CAPACITOR-FXD .022UF +-10% 200VDC POLYE	28480	0160-0162
ASC35	0160-5229	5	1	CAPACITOR-FXD .33UF +-10% 50VDC CER	28480	0160-5229
ASC36	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
ASC37	0160-6685	9	1	CAPACITOR-FXD .1UF +80-20% 50VDC CER	28480	0160-6685
ASC38	0160-3982	9	1	CAPACITOR-FXD .12UF +-5% 200VDC	28480	0160-3982
ASC39	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
ASC40	0150-0121	5	1	CAPACITOR-FXD .1UF +80-20% 50VDC CER	28480	0150-0121
ASC41	0160-4830	2	1	CAPACITOR-FXD 2200PF +-10% 100VDC CER	28480	0160-4830
ASC42	0180-0374	3	1	CAPACITOR-FXD 10UF+-10% 20VDC TA	56289	150D106X9020B2
ASC43	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
ASC44	0160-4835	7	1	CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
ASC45	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
ASC46	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
ASC47	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
ASC48	0160-0153	4		CAPACITOR-FXD 1000PF +-10% 200VDC POLYE	28480	0160-0153
ASC49	0140-0196	3	1	CAPACITOR-FXD 150PF +-5% 300VDC MICA	72136	DM15F151J0300WV1CR
ASC50	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
ASC51	0160-0153	4		CAPACITOR-FXD 1000PF +-10% 200VDC POLYE	28480	0160-0153
ASC52	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
ASC53	0160-0153	4		CAPACITOR-FXD 1000PF +-10% 200VDC POLYE	28480	0160-0153
ASC54	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
ASC55	0160-0153	4		CAPACITOR-FXD 1000PF +-10% 200VDC POLYE	28480	0160-0153
ASC56	0160-0153	4		CAPACITOR-FXD 1000PF +-10% 200VDC POLYE	28480	0160-0153
ASCR1	1901-0044	5	3	DIODE-SWITCHING 50V 50MA 6NS	28480	1901-0044
ASCR2	1901-0044	5		DIODE-SWITCHING 50V 50MA 6NS	28480	1901-0044
ASCR3	1901-0044	5		DIODE-SWITCHING 50V 50MA 6NS	28480	1901-0044
ASCR4	1901-0025	2	1	DIODE-GEN PRP 100V 200MA D0-7	28480	1901-0025
ASCR5	1901-0040	1	4	DIODE-SWITCHING 30V 50MA 2NS D0-35	28480	1901-0040
ASCR6	1901-0040	1		DIODE-SWITCHING 30V 50MA 2NS D0-35	28480	1901-0040
ASCR7	1901-0040	1		DIODE-SWITCHING 30V 50MA 2NS D0-35	28480	1901-0040
ASCR8	1901-0040	1		DIODE-SWITCHING 30V 50MA 2NS D0-35	28480	1901-0040
ASF1	2110-0588	6	1	FUSE .2A 250V TD IEC	28480	2110-0588
ASJ1	1251-5721	6	1	CONNECTOR 40-PIN M POST TYPE	28480	1251-5721
ASQ1	1854-0215	1	2	TRANSISTOR NPN SI PD=350MW FT=300MHZ	04713	2N3904
ASQ2	1853-0036	2	2	TRANSISTOR PNP SI PD=310MW FT=250MHZ	28480	1853-0036
ASQ3	1853-0479	7	1	TRANSISTOR PNP DARL TO-220AB PD=50W	28480	1853-0479
ASQ4	1853-0041	9	1	TRANSISTOR PNP SI TO-39 PD=1W FT=60MHZ	28480	1853-0041
ASQ5	1854-0637	1	1	TRANSISTOR NPN 2N2219A SI TO-5 PD=800MW	01295	2N2219A

Table 4-5. Parts List, Internal I/O PCA (A5) — Model 7580B (Continued)

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A5Q6	1854-0090	0	1	TRANSISTOR NPN SI TO-39 PD=1W FT=100MHZ	28480	1854-0090
A5Q7	1854-0467	5	1	TRANSISTOR NPN 2N4401 SI TO-92 PD=310MW	03508	2N4401
A5Q8	1854-0215	1		TRANSISTOR NPN SI PD=350MW FT=300MHZ	04713	2N3904
A5Q9	1853-0036	2		TRANSISTOR PNP SI PD=310MW FT=250MHZ	28480	1853-0036
A5R1	0811-1666	7	1	RESISTOR 1.5% 2W PW TC=0+-800	75042	BWH2-1R0-J
A5R2	0698-3635	2	1	RESISTOR 680 5% 2W MO TC=0+-200	28480	0698-3635
A5R3	0757-0449	6	9	RESISTOR 20K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2002-F
A5R4	0698-3454	3	1	RESISTOR 215K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2153-F
A5R5	0757-0458	7	4	RESISTOR 51.1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5112-F
A5R6	0757-0449	6		RESISTOR 20K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2002-F
A5R7	0757-0442	9	9	RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A5R8	0757-0465	6	4	RESISTOR 100K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1003-F
A5R9	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A5R10	0757-0466	7	1	RESISTOR 110K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1103-F
A5R11	0757-0280	3	10	RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A5R12	0757-0283	6	2	RESISTOR 2K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2001-F
A5R13	0757-0413	4	1	RESISTOR 392 1% .125W F TC=0+-100	24546	C4-1/8-T0-392R-F
A5R14	0757-0449	6		RESISTOR 20K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2002-F
A5R15	0757-0283	6		RESISTOR 2K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2001-F
A5R16	0698-4397	5	1	RESISTOR 84.5 1% .125W F TC=0+-100	24546	C4-1/8-T0-0485-F
A5R17	0757-0449	6		RESISTOR 20K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2002-F
A5R18	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A5R19	0757-0833	2	1	RESISTOR 5.11K 1% .5W F TC=0+-100	28480	0757-0833
A5R20	0757-0421	4	1	RESISTOR 825 1% .125W F TC=0+-100	24546	C4-1/8-T0-825R-F
A5R21	0757-0465	6		RESISTOR 100K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1003-F
A5R22	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A5R23	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A5R24	0757-0290	5	2	RESISTOR 6.19K 1% .125W F TC=0+-100	19701	MF4C1/8-T0-6191-F
A5R25	0698-3446	3	1	RESISTOR 383 1% .125W F TC=0+-100	24546	C4-1/8-T0-383R-F
A5R26	0698-3435	0	2	RESISTOR 38.3 1% .125W F TC=0+-100	24546	C4-1/8-T0-383R-F
A5R27	0698-3453	2	6	RESISTOR 196K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1963-F
A5R28	0757-0290	5		RESISTOR 6.19K 1% .125W F TC=0+-100	19701	MF4C1/8-T0-6191-F
A5R29	0698-3155	1	1	RESISTOR 4.64K 1% .125W F TC=0+-100	24546	C4-1/8-T0-4641-F
A5R30	0698-3156	2	3	RESISTOR 14.7K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1472-F
A5R31	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A5R32	0698-3154	0	2	RESISTOR 4.22K 1% .125W F TC=0+-100	24546	C4-1/8-T0-4221-F
A5R33	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A5R34	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A5R35	0698-3154	0		RESISTOR 4.22K 1% .125W F TC=0+-100	24546	C4-1/8-T0-4221-F
A5R36	0761-0068	4	1	RESISTOR 4.7K 5% 1W MO TC=0+-200	28480	0761-0068
A5R37	0698-6250	3	1	RESISTOR 2.5K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2501-F
A5R38	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A5R39	0698-3453	2		RESISTOR 196K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1963-F
A5R40	0683-4725	2	2	RESISTOR 4.7K 5% .25W FC TC=-400/+700	01121	CB4725
A5R41	0683-4725	2		RESISTOR 4.7K 5% .25W FC TC=-400/+700	01121	CB4725
A5R42	0683-0395	4	1	RESISTOR 3.9 5% .25W FC TC=-400/+500	01121	CB39G5
A5R43	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A5R44	0757-0279	0	6	RESISTOR 3.16K 1% .125W F TC=0+-100	24546	C4-1/8-T0-3161-F
A5R45	0757-0465	6		RESISTOR 100K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1003-F
A5R46	0757-0449	6		RESISTOR 20K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2002-F
A5R47	0698-3440	7	1	RESISTOR 196 1% .125W F TC=0+-100	24546	C4-1/8-T0-196R-F
A5R48	0757-0798	8	1	RESISTOR 110 1% .5W F TC=0+-100	28480	0757-0798
A5R49	0757-0439	4	3	RESISTOR 6.81K 1% .125W F TC=0+-100	24546	C4-1/8-T0-6811-F
A5R50	0757-0449	6		RESISTOR 20K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2002-F
A5R51	0757-0449	6		RESISTOR 20K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2002-F
A5R52	0757-0472	5	1	RESISTOR 200K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2003-F
A5R53	0757-0458	7		RESISTOR 51.1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5112-F
A5R54	0757-0418	9	1	RESISTOR 619 1% .125W F TC=0+-100	24546	C4-1/8-T0-619R-F
A5R55	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A5R56	0698-3152	8	1	RESISTOR 3.48K 1% .125W F TC=0+-100	24546	C4-1/8-T0-3481-F
A5R57	0698-4539	7	1	RESISTOR 402K 1% .125W F TC=0+-100	28480	0698-4539
A5R58	0757-0419	0	1	RESISTOR 681 1% .125W F TC=0+-100	24546	C4-1/8-T0-681R-F
A5R59	0757-0276	7	1	RESISTOR 61.9 1% .125W F TC=0+-100	24546	C4-1/8-T0-6192-F
A5R60	0757-0465	6		RESISTOR 100K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1003-F
A5R61	0698-3443	0	9	RESISTOR 287 1% .125W F TC=0+-100	24546	C4-1/8-T0-287R-F
A5R62	0698-3443	0		RESISTOR 287 1% .125W F TC=0+-100	24546	C4-1/8-T0-287R-F
A5R63	0757-0416	7	1	RESISTOR 511 1% .125W F TC=0+-100	24546	C4-1/8-T0-511R-F
A5R64	0698-0083	8	1	RESISTOR 1.96K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1961-F
A5R65	0698-0090	7	1	RESISTOR 464 1% .5W F TC=0+-100	28480	0698-0090
A5R66	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A5R67	0698-3443	0		RESISTOR 287 1% .125W F TC=0+-100	24546	C4-1/8-T0-287R-F
A5R68	0698-3443	0		RESISTOR 287 1% .125W F TC=0+-100	24546	C4-1/8-T0-287R-F
A5R69	0757-0288	1	1	RESISTOR 9.09K 1% .125W F TC=0+-100	19701	MF4C1/8-T0-9091-F
A5R70	0757-0279	0		RESISTOR 3.16K 1% .125W F TC=0+-100	24546	C4-1/8-T0-3161-F

Table 4-5. Parts List, Internal I/O PCA (A5) — Model 7580B (Continued)

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
ASR71	0698-3156	2	1	RESISTOR 14.7K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1472-F
ASR72	0698-3161	9		RESISTOR 38.3K 1% .125W F TC=0+-100	24546	C4-1/8-T0-3832-F
ASR73	0698-3443	0		RESISTOR 287 1% .125W F TC=0+-100	24546	C4-1/8-T0-287R-F
ASR74	0757-0797	7		RESISTOR 90.9 1% .5W F TC=0+-100	28480	0757-0797
ASR75	0757-0279	0		RESISTOR 3.16K 1% .125W F TC=0+-100	24546	C4-1/8-T0-3161-F
ASR76	0698-3156	2	1	RESISTOR 14.7K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1472-F
ASR77	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
ASR78	0698-3443	0		RESISTOR 287 1% .125W F TC=0+-100	24546	C4-1/8-T0-287R-F
ASR79	0757-0417	8		RESISTOR 562 1% .125W F TC=0+-100	24546	C4-1/8-T0-562R-F
ASR80	0757-0279	0		RESISTOR 3.16K 1% .125W F TC=0+-100	24546	C4-1/8-T0-3161-F
ASR81	0698-3443	0	1	RESISTOR 287 1% .125W F TC=0+-100	24546	C4-1/8-T0-287R-F
ASR82	0698-3688	5		RESISTOR 18 5% 1W MO TC=0+-200	27167	FP32-1-T00-18R0-J
ASR83	0757-0279	0		RESISTOR 3.16K 1% .125W F TC=0+-100	24546	C4-1/8-T0-3161-F
ASR84	0698-3453	2		RESISTOR 196K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1963-F
ASR85	0698-3443	0		RESISTOR 287 1% .125W F TC=0+-100	24546	C4-1/8-T0-287R-F
ASR86	0757-0449	6	1	RESISTOR 20K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2002-F
ASR87	0757-0449	6		RESISTOR 20K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2002-F
ASR88	0699-0833	8		RESISTOR 100 2% .25W F TC=0+-100	28480	0699-0833
ASR89	0698-3443	0		RESISTOR 287 1% .125W F TC=0+-100	24546	C4-1/8-T0-287R-F
ASR90	0698-3435	0		RESISTOR 38.3 1% .125W F TC=0+-100	24546	C4-1/8-T0-3832-F
ASR91	0757-0280	3	1	RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
ASR92	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
ASR93	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
ASR94	0757-0458	9		RESISTOR 51.1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5112-F
ASR95	0757-0442	7		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
ASR96	0698-3157	3	1	RESISTOR 19.6K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1962-F
ASR97	0757-0279	2		RESISTOR 3.16K 1% .125W F TC=0+-100	24546	C4-1/8-T0-3161-F
ASR98	0698-3453	0		RESISTOR 196K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1963-F
ASR99	2100-3207	1		RESISTOR-TRMR 5K 10% C SIDE-ADJ 1-TRN	28480	2100-3207
ASR100	0757-0439	4		RESISTOR 6.81K 1% .125W F TC=0+-100	24546	C4-1/8-T0-6811-F
ASR101	2100-3353	8	1	RESISTOR-TRMR 20K 10% C SIDE-ADJ 1-TRN	28480	2100-3353
ASR102	2100-3274	2		RESISTOR-TRMR 10K 10% C SIDE-ADJ 1-TRN	28480	2100-3274
ASR103	2100-3274	2		RESISTOR-TRMR 10K 10% C SIDE-ADJ 1-TRN	28480	2100-3274
ASR104	0757-0458	7		RESISTOR 51.1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5112-F
ASR105	2100-3274	2		RESISTOR-TRMR 10K 10% C SIDE-ADJ 1-TRN	28480	2100-3274
ASR106	2100-3207	1	1	RESISTOR-TRMR 5K 10% C SIDE-ADJ 1-TRN	28480	2100-3207
ASR107	2100-3273	1		RESISTOR-TRMR 2K 10% C SIDE-ADJ 1-TRN	28480	2100-3273
ASR108	2100-3274	2		RESISTOR-TRMR 10K 10% C SIDE-ADJ 1-TRN	28480	2100-3274
ASR109	2100-3274	2		RESISTOR-TRMR 10K 10% C SIDE-ADJ 1-TRN	28480	2100-3274
ASR110	0757-0439	4		RESISTOR 6.81K 1% .125W F TC=0+-100	24546	C4-1/8-T0-6811-F
ASR111	0698-3453	2	1	RESISTOR 196K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1963-F
ASR112	2100-4012	8		RESISTOR-VAR 50K OHM 10%	28480	2100-4012
ASR113	0698-3453	2		RESISTOR 196K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1963-F
ASR114	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
ASR115	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
ASR116	1810-0279	5	3	NETWORK-RES 10-SIP4.7K OHM X 9	01121	210A472
ASR117	1810-0231	9		NETWORK-RES 8-SIP2.2K OHM X 7	01121	208A222
ASR118	1810-0279	5		NETWORK-RES 10-SIP4.7K OHM X 9	01121	210A472
ASR119	1810-0279	5		NETWORK-RES 10-SIP4.7K OHM X 9	01121	210A472
ASR120	1810-0279	5		NETWORK-RES 10-SIP4.7K OHM X 9	01121	210A472
ASTP1	1251-0600	0	19	CONNECTOR-SGL CONT PIN .031-IN-BSC-SZ	28480	1251-0600
ASTP2	1251-0600	0		CONNECTOR-SGL CONT PIN .031-IN-BSC-SZ	28480	1251-0600
ASTP3	1251-0600	0		CONNECTOR-SGL CONT PIN .031-IN-BSC-SZ	28480	1251-0600
ASTP4	1251-0600	0		CONNECTOR-SGL CONT PIN .031-IN-BSC-SZ	28480	1251-0600
ASTP5	1251-0600	0		CONNECTOR-SGL CONT PIN .031-IN-BSC-SZ	28480	1251-0600
ASTP6	1251-0600	0	1	CONNECTOR-SGL CONT PIN .031-IN-BSC-SZ	28480	1251-0600
ASTP7	1251-0600	0		CONNECTOR-SGL CONT PIN .031-IN-BSC-SZ	28480	1251-0600
ASTP8	1251-0600	0		CONNECTOR-SGL CONT PIN .031-IN-BSC-SZ	28480	1251-0600
ASTP9	1251-0600	0		CONNECTOR-SGL CONT PIN .031-IN-BSC-SZ	28480	1251-0600
ASTP10	1251-0600	0		CONNECTOR-SGL CONT PIN .031-IN-BSC-SZ	28480	1251-0600
ASTP11	1251-0600	0	1	CONNECTOR-SGL CONT PIN .031-IN-BSC-SZ	28480	1251-0600
ASTP12	1251-0600	0		CONNECTOR-SGL CONT PIN .031-IN-BSC-SZ	28480	1251-0600
ASTP13	1251-0600	0		CONNECTOR-SGL CONT PIN .031-IN-BSC-SZ	28480	1251-0600
ASTP14	1251-0600	0		CONNECTOR-SGL CONT PIN .031-IN-BSC-SZ	28480	1251-0600
ASTP15	1251-0600	0		CONNECTOR-SGL CONT PIN .031-IN-BSC-SZ	28480	1251-0600
ASTP16	1251-0600	0	1	CONNECTOR-SGL CONT PIN .031-IN-BSC-SZ	28480	1251-0600
ASTP17	1251-0600	0		CONNECTOR-SGL CONT PIN .031-IN-BSC-SZ	28480	1251-0600
ASTP18	1251-0600	0		CONNECTOR-SGL CONT PIN .031-IN-BSC-SZ	28480	1251-0600
ASTP19	1251-0600	0		CONNECTOR-SGL CONT PIN .031-IN-BSC-SZ	28480	1251-0600
ASTP20	1251-0600	0		CONNECTOR-SGL CONT PIN .031-IN-BSC-SZ	28480	1251-0600
ASU1	1820-1918	2	1	IC BFR TTL LS LINE DRVR OCTL	01295	SN74LS241N
ASU2	1820-2075	4		IC TRANSCEIVER TTL LS BUS OCTL	28480	1820-2075
ASU3	1820-1216	3		IC DCDR TTL LS 3-TO-8-LINE 3-INP	01295	SN74LS138N
ASU4	1820-1917	1		IC BFR TTL LS LINE DRVR OCTL	01295	SN74LS240N
ASU5	1820-2274	5		IC DRVR TTL QUAD	13606	ULN-2068B
ASU6	1826-0161	7	2	IC OP AMP GP QUAD 14-DIP-P PKG	04713	MLM324P
ASU7	1820-1216	3		IC DCDR TTL LS 3-TO-8-LINE 3-INP	01295	SN74LS138N
ASU8	1820-1730	6		IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	SN74LS273N
ASU9	1826-0416	5		IC SWITCH ANLG QUAD 16-DIP-C PKG	27014	LF13331D
ASU10	1820-1199	1		IC INV TTL LS HEX 1-INP	01295	SN74LS04N

Table 4-5. Parts List, Internal I/O PCA (A5) — Model 7580B (Continued)

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A5U11	1820-1730	6		IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	SN74LS273N
A5U12	1820-1730	6		IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	SN74LS273N
A5U13	1818-1757	2	1	IC PMOS 512-BIT EARAM 2-05 3-S	14936	ER2055
A5U14	1826-0410	9	2	IC OP AMP LOW-BIAS-H-IMPD QUAD 14-DIP-P	01295	TL084CN
A5U15	1826-0180	0	2	IC TIMER TTL MONO/ASTBL	01295	NE555P
A5U16	1820-1112	8	1	IC FF TTL LS D-TYPE POS-EDGE-TRIG	01295	SN74LS74AN
A5U17	1826-0416	5		IC SWITCH ANLG QUAD 16-DIP-C PKG	27014	LF13331D
A5U18	1826-0416	5		IC SWITCH ANLG QUAD 16-DIP-C PKG	27014	LF13331D
A5U19	1820-2024	3	1	IC DRVR TTL LS LINE DRVR OCTL	01295	SN74LS244N
A5U20	1820-1730	6		IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	SN74LS273N
A5U21	1820-0668	7	1	IC BFR TTL NON-INV HEX 1-1NP	01295	SN7407N
A5U22	1820-1997	7	1	IC FF TTL LS D-TYPE POS-EDGE-TRIG PRL-IN	01295	SN74LS374N
A5U23	1820-1730	6		IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	SN74LS273N
A5U24	1826-0346	0	1	IC OP AMP GP DUAL 8-DIP-P PKG	27014	LM358N
A5U25	1826-0180	0		IC TIMER TTL MONO/ASTBL	01295	NE555P
A5U26	1826-0138	8	1	IC COMPARATOR GP QUAD 14-DIP-P PKG	01295	LM339N
A5U27	1820-1195	7	1	IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	SN74LS175N
A5U28	1826-0410	9		IC OP AMP LOW-BIAS-H-IMPD QUAD 14-DIP-P	01295	TL084CN
A5U29	1826-0161	7		IC OP AMP GP QUAD 14-DIP-P PKG	04713	MLM324P
A5U30	1826-0756	6	1	IC CONV 8-B-A/D	27014	ADC0804LCN
A5U31	1820-1730	6		IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	SN74LS273N
A5U31	1820-1917	1		IC BFR TTL LS LINE DRVR OCTL	01295	SN74LS240N
A5U32	1826-0416	5		IC SWITCH ANLG QUAD 16-DIP-C PKG	27014	LF13331D
A5VR1	1902-0944	6	1	DIODE-ZNR 2.7V 5% DO-35 PD=.4W TC=-.044%	28480	1902-0944
A5VR2	1902-0960	6	1	DIODE-ZNR 12V 5% DO-35 PD=.4W TC=+.077%	28480	1902-0960
A5VR3	1902-1331	7	1	DIODE-ZNR 6.9V 4% TO-92 TC=+.0015%	28480	1902-1331
A5VR4	1902-0654	5	1	DIODE-ZNR 33V 5% PD=1W IR=5UA	28480	1902-0654
A5VR5	1902-0947	9	1	DIODE-ZNR 3.6V 5% DO-35 PD=.4W TC=-.036%	28480	1902-0947
A5VR6	1902-0041	4	1	DIODE-ZNR 5.11V 5% DO-35 PD=.4W	28480	1902-0041
MISCELLANEOUS PARTS						
	0340-0164	9	3	INSULATOR-XSTR NYLON	28480	0340-0164
	0510-0843	2	2	PIN-SPL .062-IN-DIA .25-IN-LG SST	28480	0510-0843
	9520-0128	7	2	SCREW-MACH 2-56 .25-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
	0610-0001	6	2	NUT-HEX-DRL-CHAM 2-56-THD .062-IN-THK	00000	ORDER BY DESCRIPTION
	1200-0612	7	1	SOCKET-IC 22-CONT DIP DIP-SLDR	28480	1200-0612
	1205-0033	6	1	HEAT SINK TO-5/TO-39-CS	28480	1205-0033
	1205-0285	0	1	HEAT SINK SGL DIP	28480	1205-0285
	2110-0597	7	2	FUSEHOLDER CLIPTYPE 10A 250V	28480	2110-0597
	2190-0112	0	2	WASHER-LK HLCL NO. 2 .088-IN-ID	28480	2190-0112
	4040-0753	0	2	EXTR-PC BD GRN POLYC .062-BD-THKNS	28480	4040-0753
	1251-5591	0	2	POLARIZING KEY	28480	1251-5591

Table 4-6. Parts List, X- and Y-Axis Servo PCA (A6) — Model 7580B

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A6	07580-60107	5	1	X AND Y AXIS SERVO, PCA	28480	07580-60107
A6C1	0160-3847	9	31	CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
A6C2	0180-1746	5	1	CAPACITOR-FXD 15UF+-10% 20VDC TA	56289	150D156X9020B2
A6C3	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
A6C4	0180-2201	9	2	CAPACITOR-FXD .68UF+-20% 75VDC TA	56289	150D684X0075A2
A6C5	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
A6C6	0180-1846	6	4	CAPACITOR-FXD 2.2UF+-10% 35VDC TA	56289	150D225X9035B2
A6C7	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
A6C8	0180-1846	6		CAPACITOR-FXD 2.2UF+-10% 35VDC TA	56289	150D225X9035B2
A6C9	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
A6C10	0180-1846	6		CAPACITOR-FXD 2.2UF+-10% 35VDC TA	56289	150D225X9035B2
A6C11	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
A6C12	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
A6C13	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
A6C14	0180-2201	9		CAPACITOR-FXD .68UF+-20% 75VDC TA	56289	150D684X0075A2
A6C15	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
A6C16	0160-0153	4	1	CAPACITOR-FXD 1000PF +-10% 200VDC POLYE	28480	0160-0153
A6C17	0180-0373	2	1	CAPACITOR-FXD .68UF+-10% 35VDC TA	56289	150D684X9035A2
A6C18	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
A6C19	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
A6C20	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
A6C21	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
A6C22	0160-2306	3	4	CAPACITOR-FXD 27PF +-5% 300VDC MICA	28480	0160-2306
A6C23	0160-2306	3		CAPACITOR-FXD 27PF +-5% 300VDC MICA	28480	0160-2306
A6C24	0160-3533	0	1	CAPACITOR-FXD 470PF +-5% 300VDC MICA	28480	0160-3533
A6C25	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
A6C26	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
A6C27	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
A6C28	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
A6C29	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
A6C30	0160-2229	9	4	CAPACITOR-FXD 3000PF +-5% 300VDC MICA	28480	0160-2229
A6C31	0160-2229	9		CAPACITOR-FXD 3000PF +-5% 300VDC MICA	28480	0160-2229
A6C32	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
A6C33	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
A6C34	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
A6C35	0160-2204	0	2	CAPACITOR-FXD 100PF +-5% 300VDC MICA	28480	0160-2204
A6C36	0160-2204	0		CAPACITOR-FXD 100PF +-5% 300VDC MICA	28480	0160-2204
A6C37	0160-2229	9		CAPACITOR-FXD 3000PF +-5% 300VDC MICA	28480	0160-2229
A6C38	0160-2229	9		CAPACITOR-FXD 3000PF +-5% 300VDC MICA	28480	0160-2229
A6C39	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
A6C40	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
A6C41	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
A6C42	0160-2150	5	2	CAPACITOR-FXD 33PF +-5% 300VDC MICA	28480	0160-2150
A6C43	0160-2150	5		CAPACITOR-FXD 33PF +-5% 300VDC MICA	28480	0160-2150
A6C44	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
A6C45	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
A6C46	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
A6C47	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
A6C48	0180-1846	6		CAPACITOR-FXD 2.2UF+-10% 35VDC TA	56289	150D225X9035B2
A6C49	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
A6C50	0160-2306	3		CAPACITOR-FXD 27PF +-5% 300VDC MICA	28480	0160-2306
A6C51	0160-2306	3		CAPACITOR-FXD 27PF +-5% 300VDC MICA	28480	0160-2306
A6C52	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
A6C53	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
A6CR1	1901-0044	5	8	DIODE-SWITCHING 50V 50MA 6NS	28480	1901-0044
A6CR2	1901-0044	5		DIODE-SWITCHING 50V 50MA 6NS	28480	1901-0044
A6CR3	1901-0044	5		DIODE-SWITCHING 50V 50MA 6NS	28480	1901-0044
A6CR4	1901-0044	5		DIODE-SWITCHING 50V 50MA 6NS	28480	1901-0044
A6CR5	1901-0044	5		DIODE-SWITCHING 50V 50MA 6NS	28480	1901-0044
A6CR6	1901-0044	5		DIODE-SWITCHING 50V 50MA 6NS	28480	1901-0044
A6CR7	1901-0044	5		DIODE-SWITCHING 50V 50MA 6NS	28480	1901-0044
A6CR8	1901-0044	5		DIODE-SWITCHING 50V 50MA 6NS	28480	1901-0044
A6DS1-3	1990-0780	3	1	LED-LAMP ARRAY LUM-INT=500UCD	28480	HLMP-6203
A6Q1	1854-0215	1	2	TRANSISTOR NPN SI PD=350MW FT=300MHZ	04713	2N3904
A6Q2	1854-0090	0	3	TRANSISTOR NPN SI TO-39 PD=1W FT=100MHZ	28480	1854-0090
A6Q3	1854-0215	1		TRANSISTOR NPN SI PD=350MW FT=300MHZ	04713	2N3904
A6Q4	1854-0090	0		TRANSISTOR NPN SI TO-39 PD=1W FT=100MHZ	28480	1854-0090
A6Q5	1854-0090	0		TRANSISTOR NPN SI TO-39 PD=1W FT=100MHZ	28480	1854-0090
A6Q6	1853-0041	9	2	TRANSISTOR PNP SI TO-39 PD=1W FT=60MHZ	28480	1853-0041
A6Q7	1853-0041	9		TRANSISTOR PNP SI TO-39 PD=1W FT=60MHZ	28480	1853-0041

Table 4-6. Parts List, X- and Y-Axis Servo PCA (A6) — Model 7580B (Continued)

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A6R1	0698-3156	2	1	RESISTOR 14.7K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1472-F
A6R2	0757-0200	7	5	RESISTOR 5.62K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5621-F
A6R3	0757-0200	7		RESISTOR 5.62K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5621-F
A6R4	0698-3154	0	1	RESISTOR 4.22K 1% .125W F TC=0+-100	24546	C4-1/8-T0-4221-F
A6R5	0757-0465	6	1	RESISTOR 100K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1003-F
A6R6	0757-0200	7		RESISTOR 5.62K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5621-F
A6R7	0757-0200	3	12	RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A6R8	0757-0401	0	2	RESISTOR 100 1% .125W F TC=0+-100	24546	C4-1/8-T0-101-F
A6R9	0757-0440	7	2	RESISTOR 7.5K 1% .125W F TC=0+-100	24546	C4-1/8-T0-7501-F
A6R10	0757-0200	7		RESISTOR 5.62K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5621-F
A6R11	0757-0440	7		RESISTOR 7.5K 1% .125W F TC=0+-100	24546	C4-1/8-T0-7501-F
A6R12	0757-0200	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A6R13	0757-0200	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A6R14	0757-0279	0	1	RESISTOR 3.16K 1% .125W F TC=0+-100	24546	C4-1/8-T0-3161-F
A6R15	0757-0200	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A6R16	0757-0200	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A6R17	0757-0200	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A6R18	0757-0200	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A6R19	0698-3446	3	2	RESISTOR 383 1% .125W F TC=0+-100	24546	C4-1/8-T0-383R-F
A6R20	0698-3446	3		RESISTOR 383 1% .125W F TC=0+-100	24546	C4-1/8-T0-383R-F
A6R21	0757-0200	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A6R22	0757-0438	3	2	RESISTOR 5.11K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5111-F
A6R23	0757-0438	3		RESISTOR 5.11K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5111-F
A6R24	0698-0085	0	6	RESISTOR 2.61K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2611-F
A6R25	0698-0085	0		RESISTOR 2.61K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2611-F
A6R26	0698-0085	0		RESISTOR 2.61K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2611-F
A6R27	0698-0085	0		RESISTOR 2.61K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2611-F
A6R28	0757-0441	8	2	RESISTOR 8.25K 1% .125W F TC=0+-100	24546	C4-1/8-T0-8251-F
A6R29	0757-0200	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A6R30	0757-0200	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A6R31	0757-0200	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A6R32	0699-0827	0	6	RESISTOR 422 5% .25W F TC=0+-100	28480	0699-0827
A6R33	0699-0827	0		RESISTOR 422 5% .25W F TC=0+-100	28480	0699-0827
A6R34	0699-0827	0		RESISTOR 422 5% .25W F TC=0+-100	28480	0699-0827
A6R35	0757-0826	3	2	RESISTOR 2.43K 1% .5W F TC=0+-100	19701	MF7C1/2-T0-2431-F
A6R36	0699-0827	0		RESISTOR 422 5% .25W F TC=0+-100	28480	0699-0827
A6R37	0757-0826	3		RESISTOR 2.43K 1% .5W F TC=0+-100	19701	MF7C1/2-T0-2431-F
A6R38	0699-0827	0		RESISTOR 422 5% .25W F TC=0+-100	28480	0699-0827
A6R39	0699-0827	0		RESISTOR 422 5% .25W F TC=0+-100	28480	0699-0827
A6R40	0698-3456	5	2	RESISTOR 287K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2873-F
A6R41	0757-0441	8		RESISTOR 8.25K 1% .125W F TC=0+-100	24546	C4-1/8-T0-8251-F
A6R42	0698-3456	5		RESISTOR 287K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2873-F
A6R43	0757-0416	7	1	RESISTOR 511 1% .125W F TC=0+-100	24546	C4-1/8-T0-5111-F
A6R44	0698-0085	0	2	RESISTOR 2.61K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2611-F
A6R45	0698-0085	0		RESISTOR 2.61K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2611-F
A6R46	0683-3915	0	1	RESISTOR 390 5% .25W FC TC=-400/+600	01121	CB3915
A6R47	0757-0200	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A6R48	8159-0005	0	3	RESISTOR-0 OHMS 22 AWG LEAD DIA	28480	8159-0005
A6R49	8159-0005	0		RESISTOR-0 OHMS 22 AWG LEAD DIA	28480	8159-0005
A6R50	8159-0005	0		RESISTOR-0 OHMS 22 AWG LEAD DIA	28480	8159-0005
A6R51	2100-3109	2	1	RESISTOR-TRMR 2K 10% C SIDE-ADJ 17-TRN	02111	43P202
A6R52	0698-3151	7	2	RESISTOR 2.87K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2871-F
A6R53	0698-3151	7		RESISTOR 2.87K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2871-F
A6R54	0757-0200	7		RESISTOR 5.62K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5621-F
A6R55	0698-3155	1	1	RESISTOR 4.64K 1% .125W F TC=0+-100	24546	C4-1/8-T0-4641-F
A6R56	0757-0401	0		RESISTOR 100 1% .125W F TC=0+-100	24546	C4-1/8-T0-101-F
A6R57	0757-0442	9	6	RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A6R58	0757-0459	7	2	RESISTOR 51.1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5112-F
A6R59	0757-0459	7		RESISTOR 51.1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5112-F
A6R60	0698-3260	9	2	RESISTOR 464K 1% .125W F TC=0+-100	24546	C4-1/8-T0-4643-F
A6R61	0698-3260	9		RESISTOR 464K 1% .125W F TC=0+-100	24546	C4-1/8-T0-4643-F
A6R62	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A6R63	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A6R64	0698-3459	8	1	RESISTOR 383K 1% .125W F TC=0+-100	28480	0698-3459
A6R65	0698-7332	4	2	RESISTOR 1M 1% .125W F TC=0+-100	28480	0698-7332
A6R66	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A6R67	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A6R68	2100-3356	1	4	RESISTOR-TRMR 200K 10% C SIDE-ADJ 1-TRN	28480	2100-3356
A6R69	2100-3356	1		RESISTOR-TRMR 200K 10% C SIDE-ADJ 1-TRN	28480	2100-3356
A6R70	2100-3356	1		RESISTOR-TRMR 200K 10% C SIDE-ADJ 1-TRN	28480	2100-3356
A6R71	0698-7878	3	1	RESISTOR 150K 1% .125W F TC=0+-25	19701	MF4C1/8-T9-1506-F
A6R72	0698-3160	8	1	RESISTOR 31.6K 1% .125W F TC=0+-100	24546	C4-1/8-T0-3162-F
A6R73	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A6R74	0698-7332	4		RESISTOR 1M 1% .125W F TC=0+-100	28480	0698-7332
A6R75	2100-3356	1		RESISTOR-TRMR 200K 10% C SIDE-ADJ 1-TRN	28480	2100-3356

Table 4-6. Parts List, X- and Y-Axis Servo PCA (A6) — Model 7580B (Continued)

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A6RN1	1810-0277	3	1	NETWORK-RES 10-SIP2.2K OHM X 9	01121	210A222
A6S1	3101-2364	2	1	SWITCH-SL DPDT SUBMIN .25A 125VAC PC	28480	3101-2364
A6S2	3101-2423	4	2	SWITCH-SL 4PDT MINTR .3A 125VAC PC	28480	3101-2423
A6S3	3101-2423	4		SWITCH-SL 4PDT MINTR .3A 125VAC PC	28480	3101-2423
A6U1	1826-0138	8	1	IC COMPARATOR GP QUAD 14-DIP-P PKG	01295	LM339N
A6U2	1820-1730	6	1	IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	SN74LS273N
A6U3	1820-1195	7	3	IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	SN74LS175N
A6U4	1820-1918	2	1	IC BFR TTL LS LINE DRVR OCTL	01295	SN74LS241N
A6U5	1820-2075	4	2	IC MISC TTL LS	01295	SN74LS245N
A6U6	1820-2075	4		IC MISC TTL LS	01295	SN74LS245N
A6U7	1820-1278	7	10	IC CNTR TTL LS BIN UP/DOWN SYNCHRO	01295	SN74LS191N
A6U8	1820-1112	8	3	IC FF TTL LS D-TYPE POS-EDGE-TRIG	01295	SN74LS74AN
A6U9	1820-1211	8	2	IC GATE TTL LS EXCL-OR QUAD 2-INP	01295	SN74LS86N
A6U10	1820-1211	8		IC GATE TTL LS EXCL-OR QUAD 2-INP	01295	SN74LS86N
A6U11	1820-1216	3	1	IC DCDR TTL LS 3-TO-8-LINE 3-INP	01295	SN74LS138N
A6U12	1820-1997	7	8	IC FF TTL LS D-TYPE POS-EDGE-TRIG PRL-IN	01295	SN74LS374N
A6U13	1820-1997	7		IC FF TTL LS D-TYPE POS-EDGE-TRIG PRL-IN	01295	SN74LS374N
A6U14	1820-1278	7		IC CNTR TTL LS BIN UP/DOWN SYNCHRO	01295	SN74LS191N
A6U15	1820-1201	6	2	IC GATE TTL LS AND QUAD 2-INP	01295	SN74LS08N
A6U16	1820-1112	8		IC FF TTL LS D-TYPE POS-EDGE-TRIG	01295	SN74LS74AN
A6U17	1820-1112	8		IC FF TTL LS D-TYPE POS-EDGE-TRIG	01295	SN74LS74AN
A6U18	1820-1416	5	1	IC SCHMITT-TRIG TTL LS INV HEX 1-INP	01295	SN74LS14N
A6U19	1820-1997	7		IC FF TTL LS D-TYPE POS-EDGE-TRIG PRL-IN	01295	SN74LS374N
A6U20	1820-1997	7		IC FF TTL LS D-TYPE POS-EDGE-TRIG PRL-IN	01295	SN74LS374N
A6U21	1820-1278	7		IC CNTR TTL LS BIN UP/DOWN SYNCHRO	01295	SN74LS191N
A6U22	1826-0416	5	1	IC SWITCH ANLG QUAD 16-DIP-C PKG	27014	LF13331D
A6U23	1826-0410	9	3	IC OP AMP LOW-BIAS-H-IMPQ QUAD 14-DIP-P	01295	TL084CN
A6U24	1820-1991	1	2	IC CNTR TTL LS DECD DUAL 4-BIT	01295	SN74LS390N
A6U25	1820-1195	7		IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	SN74LS175N
A6U26	1820-1201	6		IC GATE TTL LS AND QUAD 2-INP	01295	SN74LS08N
A6U27	1820-1491	6	1	IC BFR TTL LS NON-INV HEX 1-INP	01295	SN74LS367AN
A6U28	1820-1997	7		IC FF TTL LS D-TYPE POS-EDGE-TRIG PRL-IN	01295	SN74LS374N
A6U29	1820-1885	2	2	IC RGTR TTL LS D-TYPE QUAD	04713	SN74LS173N
A6U30	1820-1278	7		IC CNTR TTL LS BIN UP/DOWN SYNCHRO	01295	SN74LS191N
A6U31	1820-1991	1		IC CNTR TTL LS DECD DUAL 4-BIT	01295	SN74LS390N
A6U32	1820-1195	7		IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	SN74LS175N
A6U33	1820-1427	8	1	IC DCDR TTL LS 2-TO-4-LINE DUAL 2-INP	01295	SN74LS156N
A6U34	1820-1199	1	1	IC INV TTL LS HEX 1-INP	01295	SN74LS04N
A6U35	1820-1997	7		IC FF TTL LS D-TYPE POS-EDGE-TRIG PRL-IN	01295	SN74LS374N
A6U36	1820-1885	2		IC RGTR TTL LS D-TYPE QUAD	04713	SN74LS173N
A6U37	1820-1278	7		IC CNTR TTL LS BIN UP/DOWN SYNCHRO	01295	SN74LS191N
A6U38	1826-0410	9	1	IC OP AMP LOW-BIAS-H-IMPQ QUAD 14-DIP-P	01295	TL084CN
A6U39	1826-0846	5		IC SWITCH ANLG QUAD 16-DIP-C PKG	27014	LF13332D
A6U40	1826-0410	9		IC OP AMP LOW-BIAS-H-IMPQ QUAD 14-DIP-P	01295	TL084CN
A6U41	1820-1278	7		IC CNTR TTL LS BIN UP/DOWN SYNCHRO	01295	SN74LS191N
A6U42	1820-1997	7		IC FF TTL LS D-TYPE POS-EDGE-TRIG PRL-IN	01295	SN74LS374N
A6U43	1820-1278	7		IC CNTR TTL LS BIN UP/DOWN SYNCHRO	01295	SN74LS191N
A6U44	1820-1278	7		IC CNTR TTL LS BIN UP/DOWN SYNCHRO	01295	SN74LS191N
A6U45	1826-0861	4	1	IC CONV 10-B-D/A 16-DIP-P PKG	24355	AD7533LN
A6U46	1820-1997	7		IC FF TTL LS D-TYPE POS-EDGE-TRIG PRL-IN	01295	SN74LS374N
A6U47	1820-1278	7		IC CNTR TTL LS BIN UP/DOWN SYNCHRO	01295	SN74LS191N
A6U48	1820-1278	7		IC CNTR TTL LS BIN UP/DOWN SYNCHRO	01295	SN74LS191N
A6VR1	1902-3094	3	1	DIODE-ZNR 5.11V 2% DO-35 PD=.4W	28480	1902-3094
				MISCELLANEOUS PARTS		
	1200-0638	7	1	SOCKET-IC 14-CONT DIP DIP-SLDR	28480	1200-0638
	1251-0600	0	31	CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
	4040-0754	1	2	EXTR-PC BD BLU POLYC .062-BD-THKNS	28480	4040-0754
	0510-0843	2	2	PIN-SPL .062-IN-DIA .25-IN-LG SST	28480	0510-0843

Table 4-7. Parts List, Carousel Sensor PCA (A7) — Model 7580B

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A7	07580-60119	9	1	CARROUSEL SENSOR, PCA (DOES NOT INCLUDE PHOTO DEVICE)	28480	07580-60119
A7A1	1990-0650	6	1	SENSOR/EMITTER PAIR IF 240 MA-MAX.	28480	1990-0650
	1251-5134	5	6	MISCELLANEOUS PARTS CONNECTOR-SGL CONT SKT .017-IN-BSC-SZ	28480	1251-5134

Table 4-8. Parts List, Sensor Interconnect PCA (A8) — Model 7580B

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A8	07580-60116	6	1	SENSOR INTERCONNECT, PCA	28480	07580-60116
A8J1	1251-6519	2	1	CONNECTOR 10-PIN F FLEXIBLE CIRCUIT	28480	1251-6519
A8J2	1251-4245	7	2	CONNECTOR 2-PIN M POST TYPE	28480	1251-4245
A8J3	1251-3305	8	2	CONNECTOR 4-PIN M POST TYPE	28480	1251-3305
A8J4	1251-4245	7		CONNECTOR 2-PIN M POST TYPE	28480	1251-4245
A8J5	1251-3305	8		CONNECTOR 4-PIN M POST TYPE	28480	1251-3305
A8J6	1251-5720	5	1	CONNECTOR 34-PIN M POST TYPE	28480	1251-5720
A8J7	1200-0607	0	1	SOCKET-IC 16-CONT DIP DIP-SLDR	28480	1200-0607
A8TP1	1251-5177	6	4	CONNECTOR-SGL CONT PIN .031-IN-BSC-SZ	28480	1251-5177
A8TP2	1251-5177	6		CONNECTOR-SGL CONT PIN .031-IN-BSC-SZ	28480	1251-5177
A8TP3	1251-5177	6		CONNECTOR-SGL CONT PIN .031-IN-BSC-SZ	28480	1251-5177
A8TP4	1251-5177	6		CONNECTOR-SGL CONT PIN .031-IN-BSC-SZ	28480	1251-5177

Table 4-9. Parts List, Motor Drive Transistor PCA (A9) — Model 7580B

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A9	07580-60103	1	1	MOTOR DRIVE TRANSISTOR, PCA	28480	07580-60103
A9C1	0160-0154	5	4	CAPACITOR-FXD 2200PF +-10% 200VDC POLYE	28480	0160-0154
A9C2	0160-0154	5		CAPACITOR-FXD 2200PF +-10% 200VDC POLYE	28480	0160-0154
A9C3	0160-0154	5		CAPACITOR-FXD 2200PF +-10% 200VDC POLYE	28480	0160-0154
A9C4	0160-0154	5		CAPACITOR-FXD 2200PF +-10% 200VDC POLYE	28480	0160-0154
A9P1	1251-4884	0	1	CONNECTOR 15-PIN F POST TYPE	28480	1251-4884
A9Q1	1853-0511	8	2	TRANSISTOR PNP 2N6054 DARL PD=75W	28480	1853-0511
A9Q2	1854-0774	7	2	TRANSISTOR NPN 2N6056 SI DARL TO-3	3L585	2N6056
A9Q3	1853-0511	8		TRANSISTOR PNP 2N6054 DARL PD=75W	28480	1853-0511
A9Q4	1854-0774	7		TRANSISTOR NPN 2N6056 SI DARL TO-3	3L585	2N6056
A9Q5	1854-0697	3	1	TRANSISTOR NPN 2N5886 SI TO-3 PD=200W	04713	2N5886
A9Q6	1853-0340	1	1	TRANSISTOR PNP 2N5884 SI TO-3 PD=200W	01295	2N5884
A9Q7	1854-0892	0	1	TRANSISTOR NPN DARL TO-220AB PD=50W	28480	1854-0892
A9R1	0699-0833	8	1	RESISTOR 100 2% .25W F TC=0+-100	28480	0699-0833
A9R2	0757-0159	5	1	RESISTOR 1K 1% .5W F TC=0+-100	28480	0757-0159
A9TP1	1251-5177	6	3	CONNECTOR-SGL CONT PIN .031-IN-BSC-SZ	28480	1251-5177
A9TP2	1251-5177	6		CONNECTOR-SGL CONT PIN .031-IN-BSC-SZ	28480	1251-5177
A9TP3	1251-5177	6		CONNECTOR-SGL CONT PIN .031-IN-BSC-SZ	28480	1251-5177
A9VR1	1902-0965	1	1	DIODE-ZNR 20V 5% D0-35 PD=.4W TC=+.092%	28480	1902-0965
				MISCELLANEOUS PARTS		
	0340-0458	4	6	INSULATOR-XSTR MICA	28480	0340-0458
	0340-0765	6	1	INSULATOR-XSTR KAPTON	28480	0340-0765
	0340-0828	2	12	INSULATOR-FLG-BSHG VULC-FIBER	28480	0340-0828
	0590-0199	9	12	NUT-HEX-W/LKWR 4-40-THD .094-IN-THK	00000	ORDER BY DESCRIPTION
	2200-0523	0	12	SCREW-MACH 4-40 .562-IN-LG PAN-HD-PHL	00000	ORDER BY DESCRIPTION
	2360-0055	1	1	SCREW-MACH 6-32 .188-IN-LG BDG-HD-SLT	00000	ORDER BY DESCRIPTION
	07580-20067	2	1	HEAT SINK	28480	07580-20067

Table 4-10. Parts List, Main Interconnect PCA (A10) — Model 7580B

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A10	07580-60105	3	1	MAIN INTERCONNECT, PCA	28480	07580-60105
A10C1	0160-4574	1	11	CAPACITOR-FXD 1000PF +-10% 100VDC CER	28480	0160-4574
A10C2	0160-4574	1		CAPACITOR-FXD 1000PF +-10% 100VDC CER	28480	0160-4574
A10C3	0160-4574	1		CAPACITOR-FXD 1000PF +-10% 100VDC CER	28480	0160-4574
A10C4	0160-4574	1		CAPACITOR-FXD 1000PF +-10% 100VDC CER	28480	0160-4574
A10C5	0160-4574	1		CAPACITOR-FXD 1000PF +-10% 100VDC CER	28480	0160-4574
A10C6	0160-4574	1		CAPACITOR-FXD 1000PF +-10% 100VDC CER	28480	0160-4574
A10C7	0160-4574	1		CAPACITOR-FXD 1000PF +-10% 100VDC CER	28480	0160-4574
A10C8	0160-4574	1		CAPACITOR-FXD 1000PF +-10% 100VDC CER	28480	0160-4574
A10C9	0160-4574	1		CAPACITOR-FXD 1000PF +-10% 100VDC CER	28480	0160-4574
A10C10	0160-4574	1		CAPACITOR-FXD 1000PF +-10% 100VDC CER	28480	0160-4574
A10C11	0160-4574	1		CAPACITOR-FXD 1000PF +-10% 100VDC CER	28480	0160-4574
A10CR1	1901-0743	1	1	DIODE-PWR RECT 1N4004 400V 1A DO-41	01295	1N4004
A10J1	1251-2414	8	4	CONNECTOR-PC EDGE 25-CONT/ROW 2-ROWS	28480	1251-2414
A10J2	1251-2414	8		CONNECTOR-PC EDGE 25-CONT/ROW 2-ROWS	28480	1251-2414
A10J3	1251-2414	8		CONNECTOR-PC EDGE 25-CONT/ROW 2-ROWS	28480	1251-2414
A10J4	1251-2414	8		CONNECTOR-PC EDGE 25-CONT/ROW 2-ROWS	28480	1251-2414
A10J5A	1251-3751	8	1	CONNECTOR 8-PIN M POST TYPE	28480	1251-3751
A10J5B	1251-3305	8	3	CONNECTOR 4-PIN M POST TYPE	28480	1251-3305
A10J6	1251-5720	5	1	CONNECTOR 34-PIN M POST TYPE	28480	1251-5720
A10J7	1251-1887	7	1	CONNECTOR-PC EDGE 22-CONT/ROW 2-ROWS	28480	1251-1887
A10J8	1251-2917	6	1	CONNECTOR-PC EDGE 12-CONT/ROW 2-ROWS	28480	1251-2917
A10J9A	1251-4245	7	2	CONNECTOR 2-PIN M POST TYPE	28480	1251-4245
A10J9B	1251-3305	8		CONNECTOR 4-PIN M POST TYPE	28480	1251-3305
A10J10A	1251-3305	8		CONNECTOR 4-PIN M POST TYPE	28480	1251-3305
A10J10B	1251-4245	7		CONNECTOR 2-PIN M POST TYPE	28480	1251-4245
A10J11A	1251-4780	5	1	CONNECTOR 2-PIN M UTILITY	28480	1251-4780
A10J11B	1251-6832	2	1	CONNECTOR 5-PIN M UTILITY	28480	1251-6832
A10J12	1251-6894	6	1	CONNECTOR 15-PIN M POST TYPE	28480	1251-6894
A10K1	0490-1272	9	1	RELAY 4C 12VDC-COIL 5A 115VAC	28480	0490-1272
A10Q1	1853-0507	2	1	TRANSISTOR PNP TO-220AB PD=83W	28480	1853-0507
A10R1	0811-1099	0	2	RESISTOR 40 3% 7W PW TC=0+-20	28480	0811-1099
A10R2	0811-1099	0		RESISTOR 40 3% 7W PW TC=0+-20	28480	0811-1099
A10R3	0811-2988	8	1	RESISTOR 22 1% 7W PW TC=0+-20	91637	NS7-22R-F
A10R4	0698-5139	5	2	RESISTOR 3.9 5% .5W CC TC=0+412	01121	EB39G5
A10R5	0698-5139	5		RESISTOR 3.9 5% .5W CC TC=0+412	01121	EB39G5
A10R6	0698-3460	1	1	RESISTOR 422K 1% .125W F TC=0+-100	28480	0698-3460
				MISCELLANEOUS PARTS		
	0490-0468	3	1	SOCKET-RLY 16-CONT CRADLE DIP-SLDR	28480	0490-0468

Table 4-11. Parts List, Front Sensor PCA (A11) — Model 7580B

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A11	07580-60101	9	1	FRONT SENSOR, PCA	28480	07580-60101
A11DS1	1990-0767	6	3	LED-INFRARED IF=200MA-MAX BVR=2V	01295	TIL31
A11DS2	1990-0767	6		LED-INFRARED IF=200MA-MAX BVR=2V	01295	TIL31
A11DS3	1990-0767	6		LED-INFRARED IF=200MA-MAX BVR=2V	01295	TIL31
A11J1	1251-4245	7	1	CONNECTOR 2-PTN H POST TYPE	28480	1251-4245
				MISCELLANEOUS PARTS		
	0340-0490	4	3	INSULATOR-XSTR DAP-GL	28480	0340-0490
	07580-40055	0	1	MOUNT-SENSOR	28480	07580-40055
	07580-60096	1		PCA-SENSOR FRONT PANEL	28480	07580-60096
	2200-0107	6	3	SCREW-MACH 4-40 .375-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION

Table 4-12. Parts List, Rear Sensor PCA (A12) — Model 7580B

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A12	07580-60102	0	1	REAR SENSOR, PCA	28480	07580-60102
A12J1	1251-3305	8	1	CONNECTOR 4-PIN M POST TYPE	28480	1251-3305
A12Q1	1990-0706	3	3	PHOTOTRANSISTOR ID=100NA-MAX BVCEO=30V	01295	TIL81
A12Q2	1990-0706	3		PHOTOTRANSISTOR ID=100NA-MAX BVCEO=30V	01295	TIL81
A12Q3	1990-0706	3		PHOTOTRANSISTOR ID=100NA-MAX BVCEO=30V	01295	TIL81
				MISCELLANEOUS PARTS		
	0340-0490	4	3	INSULATOR-XSTR DAP-GL	28480	0340-0490
	07580-40055	0	1	MOUNT-SENSOR	28480	07580-40055
	07580-60097	2	1	PCA-STANDOFF, SENSOR	28480	07580-60097
	2200-0107	6	3	SCREW-MACH 4-40 .375-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION

Table 4-13. Parts List, Paper Sensor PCA (A13) — Model 7580B

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A13	07585-60118	3	1	PAPER SENSOR, PCA	28480	07585-60118
A13A1	1990-0781	4	2	REFLECTIVE TRANSDUCER LED-PXSTR	32694	0PB703
A13A2	1990-0781	4		REFLECTIVE TRANSDUCER LED-PXSTR	32694	0PB703
A13P1	1251-2615	1	3	CONNECTOR 16-PIN M RECTANGULAR	28480	1251-2615
A13W1	8120-1711	6	1	CABLE-FL-RBN 28AWG 16-CONDCT GRA-INSUL	28480	8120-1711
				MISCELLANEOUS PARTS		
	07585-40100	1	1	MOUNT-PAPER SENSOR	28480	07585-40100
	1251-5134	5	8	CONNECTOR-SGL CONT SKT .017-IN-BSC-SZ	28480	1251-5134
	2200-0107	6	2	SCREW-MACH 4-40 .375-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
	0590-0343	5	2	THREADED INSERT-NUT 4-40 .062-IN-LG	28480	0590-0343

Table 4-14. Parts List, Primary Power PCA (A14) — Model 7580B

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A14	07580-60232	7		PCA, PRIMARY POWER	28480	07580-60232
A14J1	1251-6845	7	1	PIN HDR ASSY-4 CKT	28480	1251-6845
A14J2	1251-6747	8	1	CONN 2-PIN M	28480	1251-6747
A14J3	1251-8283	1	1	CONN-8-M	28480	1251-8283
A14L1	9100-1788	6	2	CHOKE-WIDE BAND ZMAX=680 OHMS 180 MHZ	02114	VK200 20/48
A14L2	9100-1788	6		CHOKE-WIDE BAND ZMAX=680 OHMS 180 MHZ	02114	VK200 20/48
A14S1	3101-2552	0	2	SWITCH-SLIDE	28480	3101-2552
A14S2	3101-2552	0		SWITCH-SLIDE	28480	3101-2552
				MISCELLANEOUS		
	0361-1071	3	6	RIVET-BLIND .125	11815	AAP-4-3

Table 4-15. Parts List, Power Supply PCA (A15) — Model 7580B

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A15	07580-60104	2	1	POWER SUPPLY, PCA	28480	07580-60104
A15C1	0160-4832	4	9	CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A15C2	0180-2755	8	1	CAPACITOR-FXD 900UF+75-10% 25VDC AL	00353	300GJ901U025B
A15C3	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A15C4	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A15C5	0160-4844	8	1	CAPACITOR-FXD 1UF +80-20% 50VDC CER	28480	0160-4844
A15C6	0180-3094	0	2	CAPACITOR-FXD .024F+75-10% 50VDC AL	28480	0180-3094
A15C7	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A15C8	0160-0300	3	1	CAPACITOR-FXD 2700PF +-10% 200VDC POLYE	28480	0160-0300
A15C9	0180-2866	2	5	CAPACITOR-FXD 22UF+100-10% 50VDC AL	28480	0180-2866
A15C10	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A15C11	0180-2866	2		CAPACITOR-FXD 22UF+100-10% 50VDC AL	28480	0180-2866
A15C12	0170-0040	9	3	CAPACITOR-FXD .047UF +-10% 200VDC POLYE	56289	292P47392
A15C13	0180-2866	2		CAPACITOR-FXD 22UF+100-10% 50VDC AL	28480	0180-2866
A15C14	0180-2866	2		CAPACITOR-FXD 22UF+100-10% 50VDC AL	28480	0180-2866
A15C15	0180-3094	0		CAPACITOR-FXD .024F+75-10% 50VDC AL	28480	0180-3094
A15C16	0180-3077	9	1	CAPACITOR-FXD 680UF+100-10% 50VDC AL	28480	0180-3077
A15C17	0170-0040	9		CAPACITOR-FXD .047UF +-10% 200VDC POLYE	56289	292P47392
A15C18	0170-0040	9		CAPACITOR-FXD .047UF +-10% 200VDC POLYE	56289	292P47392
A15C19	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A15C20	0180-2866	2		CAPACITOR-FXD 22UF+100-10% 50VDC AL	28480	0180-2866
A15C21	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A15C22	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A15C23	0160-0492	4	1	CAPACITOR-FXD 1UF +-20% 200VDC POLYE	84411	6630W10502W
A15C24	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A15CR1	1901-0662	3	3	DIODE-PWR RECT 100V 6A	04713	MR751
A15CR2	1901-0912	6	1	DIODE-PWR RECT 45V 30A DO-4	04713	MR3545
A15CR3	1901-0050	3	2	DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A15CR4	1901-0704	4	2	DIODE-PWR RECT 1N4002 100V 1A DO-41	01295	1N4002
A15CR5	1901-0662	3		DIODE-PWR RECT 100V 6A	04713	MR751
A15CR6	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A15CR7	1901-0704	4		DIODE-PWR RECT 1N4002 100V 1A DO-41	01295	1N4002
A15CR8	1901-0662	3		DIODE-PWR RECT 100V 6A	04713	MR751
A15CR9-12	1906-0222	1	1	DIODE-FW BRDG 400V 25A	04713	MDA2504
A15F1	2110-0623	0	2	FUSE 6.3A 250V TD IEC	28480	2110-0623
A15F2	2110-0623	0		FUSE 6.3A 250V TD IEC	28480	2110-0623
A15F3	2110-0458	9	2	FUSE .5A 250V IEC	28480	2110-0458
A15F4	2110-0458	9		FUSE .5A 250V IEC	28480	2110-0458
A15F5	2110-0596	6	1	FUSE 3.15A 250V	28480	2110-0596
A15J1	1251-4780	5	1	CONNECTOR 2-PIN M UTILITY	28480	1251-4780
A15J2	1251-6832	2	1	CONNECTOR 5-PIN M UTILITY	28480	1251-6832
A15J3	1251-4781	6	1	CONNECTOR 3-PIN M UTILITY	00779	350789-1
A15L1	9140-0614	9	1	COIL-FXD 400UH	28480	9140-0614
A15L2	9100-1788	6	4	CHOKER-WIDE BAND ZMAX=680 OHM@ 180 MHZ	02114	VK200 20/48
A15L3	9100-1788	6		CHOKER-WIDE BAND ZMAX=680 OHM@ 180 MHZ	02114	VK200 20/48
A15L4	9100-1788	6		CHOKER-WIDE BAND ZMAX=680 OHM@ 180 MHZ	02114	VK200 20/48
A15L5	9100-1788	6		CHOKER-WIDE BAND ZMAX=680 OHM@ 180 MHZ	02114	VK200 20/48
A15Q1	1854-0215	1	1	TRANSISTOR NPN SI PD=350MW FT=300MHZ	04713	2N3904
A15Q2	1853-0271	7	1	TRANSISTOR PNP 2N4403 SI TO-92 PD=310MW	04713	2N4403
A15Q3	1884-0281	4	1	THYRISTOR-SCR 2N6505 TO-220AB VRRM=100	04713	2N6505
A15Q4	1854-0892	0	1	TRANSISTOR NPN DARL TO-220AB PD=50W	28480	1854-0892
A15Q5	1853-0340	1	1	TRANSISTOR PNP 2N5884 SI TO-3 PD=200W	01295	2N5884
A15Q6	1853-0479	7	1	TRANSISTOR PNP DARL TO-220AB PD=50W	28480	1853-0479
A15Q7	1854-0903	4	1	TRANSISTOR NPN TO-220AB PD=83W	28480	1854-0903
A15Q8	1854-0087	5	1	TRANSISTOR NPN SI PD=360MW FT=75MHZ	28480	1854-0087
A15Q9	1854-0547	2	2	TRANSISTOR NPN 2N3725 SI TO-5 PD=800MW	01295	2N3725
A15Q10	1854-0547	2		TRANSISTOR NPN 2N3725 SI TO-5 PD=800MW	01295	2N3725
A15R1	0698-3639	6	2	RESISTOR 1.2K 5% 2W MO TC=0+-200	27167	FP42-2-T00-1201-J
A15R2	0757-0394	0	1	RESISTOR 51.1 1% .125W F TC=0+-100	24546	C4-1/8-T0-51R1-F
A15R3	0757-0449	6	2	RESISTOR 20K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2002-F
A15R4	0757-0401	0	2	RESISTOR 100 1% .125W F TC=0+-100	24546	C4-1/8-T0-101-F
A15R5	0757-0316	6	1	RESISTOR 42.2 1% .125W F TC=0+-100	24546	C4-1/8-T0-42R2-F
A15R6	0757-0401	0		RESISTOR 100 1% .125W F TC=0+-100	24546	C4-1/8-T0-101-F
A15R7	0698-3156	2	2	RESISTOR 14.7K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1472-F
A15R8	0698-3156	2		RESISTOR 14.7K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1472-F
A15R9	0698-3428	1	1	RESISTOR 14.7 1% .125W F TC=0+-100	03888	PM55-1/8-T0-14R7-F
A15R10	0757-0449	6		RESISTOR 20K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2002-F
A15R11	0698-5808	5	1	RESISTOR 4K 1% .125W F TC=0+-100	24546	C4-1/8-T0-4001-F
A15R12	0698-0084	9	1	RESISTOR 2.15K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2151-F
A15R13	0698-3155	1	2	RESISTOR 4.64K 1% .125W F TC=0+-100	24546	C4-1/8-T0-4641-F
A15R14	0757-0280	3	3	RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A15R15	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F

Table 4-15. Parts List, Power Supply PCA (A15) — Model 7580B (Continued)

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A15R16	0698-3476	9	1	RESISTOR 6K 1% .125W F TC=0+-100	03888	PME55-1/8-T0-6001-F
A15R17	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A15R18	0757-0465	6	1	RESISTOR 100K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1003-F
A15R19	0698-3154	0	1	RESISTOR 4.22K 1% .125W F TC=0+-100	24546	C4-1/8-T0-4221-F
A15R20	2100-3211	7	1	RESISTOR-TRMR 1K 10% C TOP-ADJ 1-TRN	28480	2100-3211
A15R21	0698-3639	6		RESISTOR 1.2K 5% 2W MO TC=0+-200	27167	FP42-2-T00-1201-J
A15R22	0698-8691	0	1	RESISTOR 4 1% .125W F TC=0+-100	28480	0698-8691
A15R23	0757-0442	9	1	RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A15R24	0761-0041	3	1	RESISTOR 56 5% 1W MO TC=0+-200	28480	0761-0041
A15R25	0811-1098	9	1	RESISTOR 80 5% 5W PW TC=0+-50	28480	0811-1098
A15R26	0757-0384	8	1	RESISTOR 20 1% .125W F TC=0+-100	19701	MF4C1/8-T0-20R0-F
A15R27	0757-0447	4	2	RESISTOR 16.2K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1622-F
A15R28	0757-0447	4		RESISTOR 16.2K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1622-F
A15R29	0698-3153	9	1	RESISTOR 3.83K 1% .125W F TC=0+-100	24546	C4-1/8-T0-3831-F
A15R30	0757-0290	5	1	RESISTOR 6.19K 1% .125W F TC=0+-100	19701	MF4C1/8-T0-6191-F
A15R31	0757-0159	5	1	RESISTOR 1K 1% .5W F TC=0+-100	28480	0757-0159
A15R32	0698-3155	1		RESISTOR 4.64K 1% .125W F TC=0+-100	24546	C4-1/8-T0-4641-F
A15T1	9170-0567	4	1	CORE-TOROID AL=3000-NH/T	28480	9170-0567
A15TP1	1251-5177	6	6	CONNECTOR-SGL CONT PIN .031-IN-BSC-SZ	28480	1251-5177
A15TP2	1251-5177	6		CONNECTOR-SGL CONT PIN .031-IN-BSC-SZ	28480	1251-5177
A15TP3	1251-5177	6		CONNECTOR-SGL CONT PIN .031-IN-BSC-SZ	28480	1251-5177
A15TP4	1251-5177	6		CONNECTOR-SGL CONT PIN .031-IN-BSC-SZ	28480	1251-5177
A15TP5	1251-5177	6		CONNECTOR-SGL CONT PIN .031-IN-BSC-SZ	28480	1251-5177
A15TP6	1251-5177	6		CONNECTOR-SGL CONT PIN .031-IN-BSC-SZ	28480	1251-5177
A15U1	1826-0806	7	1	IC MISC CHIP PKG	28480	1826-0806
A15U2	1826-0147	9	1	IC 7812 V RGLTR T0-220	04713	MC7812CP
A15U3	1826-0418	7	1	IC 320T-12 V RGLTR T0-220	07263	UA7912UC
A15VR1	1902-3104	6	1	DIODE-ZNR 5.62V 5% D0-35 PD=.4W	28480	1902-3104
A15VR2	1902-3220	7	2	DIODE-ZNR 16.9V 2% D0-35 PD=.4W	28480	1902-3220
A15VR3	1902-3220	7		DIODE-ZNR 16.9V 2% D0-35 PD=.4W	28480	1902-3220
A15W1	03999-11019	2	1	WIRE ASSEMBLY	28480	03999-11019
A15W2	03999-20381	0	2	WIRE ASSEMBLY	28480	03999-20381
A15W3	03999-20381	0		WIRE ASSEMBLY	28480	03999-20381
A15W4	07580-60062	1	1	CABLE-TRANSFORMER, SECONDARY	28480	07580-60062
				MISCELLANEOUS PARTS		
	0340-0150	3	2	INSULATOR-FLG-BSHG VULC-FIBER	28480	0340-0150
	0340-1005	9	5	INSULATOR-XSTR POLYI	28480	0340-1005
	1200-0043	8	1	INSULATOR-XSTR ALUMINUM	28480	1200-0043
	1200-0080	3	1	INSULATOR-DIO ALUMINUM HD-ANDZ	28480	1200-0080
	2110-0597	7	10	FUSEHOLDER-CLIP TYPE 10A 250 V	28480	2110-0597
	07580-00068	1	1	CHASSIS-POWER SUPPLY	28480	07580-00068
	07580-00069	2	1	MOUNT-POWER SUPPLY	28480	07580-00069
	07580-00070	5	1	CLAMP-CAPACITOR	28480	07580-00070
	07580-20131	1	1	HEAT SINK-POWER SUPPLY	28480	07580-20131
	07580-20132	2	1	HEAT SINK-POWER SUPPLY	28480	07580-20132
	07580-60087	0	1	STANDOFF-POWER SUPPLY	28480	07580-60087
	0624-0341	6	3	SCREW-TPG 6-32 .625-IN-LG 82 DEG	00000	ORDER BY DESCRIPTION
	2360-0055	1	5	SCREW-MACH 6-32 .188-IN-LG BDG-HD-SLT	00000	ORDER BY DESCRIPTION
	2360-0117	6	14	SCREW-MACH 6-32 .375-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
	2680-0271	1	4	SCREW-MACH 10-32 .312-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
	2200-0523	0	2	SCREW-MACH 4-40 .562-IN-LG PAN-HD-PHL	00000	ORDER BY DESCRIPTION
	2190-0311	1	1	WASHER-SHLDR NO. 10 .195-IN-ID	28480	2190-0311
	3050-0066	8	2	WASHER-FL MTLN NO. 6 .147-IN-ID	28480	3050-0066
	2260-0009	3	2	NUT-HEX-W/LKWR 4-40-THD .094-IN-THK	00000	ORDER BY DESCRIPTION
	2740-0003	5	1	NUT-HEX-W/LKWR 10-32-THD .125-IN-THK	00000	ORDER BY DESCRIPTION
	1251-5613	5	1	CONNECTOR-SGL CONT QDISC-M TAB	28480	1251-5613
	2190-0008	3	1	WASHER-LK EXT T NO. 6 .141-IN-ID	28480	2190-0008
	2360-0205	3	1	SCREW-MACH 6-32 .75-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION

Table 4-16. Parts List, Front Panel and Pen Carousel Cover Assemblies — Model 7580B

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
1	07580-00142	2	1	PANEL-FRONT (LH)	28480	07580-00142
2	07580-60126	8	1	CASE-TOP-LH (CAROUSEL COVER)	28480	07580-60126
3	3050-0066	8	10	WASHER-FL MTLC NO. 6 .147-IN-ID	28480	3050-0066
4	0590-0381	1	10	NUT-HEX-W/LKWR 6-32-THD .12-IN-THK	00000	ORDER BY DESCRIPTION
5	0510-1067	4	4	STUD-THD-ROD 6.32 UNC-2A 1-IN-LG SST	28480	0510-1067
6	07580-20133	3	4	SPACER-TOP CASE (STANDOFF)	28480	07580-20133
7	07580-40110	8	1	MOUNTING CUP	28480	07580-40110
8	5041-2011	0	1	KEY CAP-CHART HOLD	28480	5041-2011
9	5041-2012	1	1	KEY CAP-CHART UNHOLD	28480	5041-2012
10	5041-0796	4	1	KEY CAP-P1	28480	5041-0796
11	5041-0069	4	1	KEY CAP-ENTER	28480	5041-0069
12	5041-2014	3	1	KEY CAP-VIEW	28480	5041-2014
13	5041-2013	2	1	KEY CAP-REMOTE	28480	5041-2013
14	5041-2009	6	1	KEY CAP-AXIS ALIGN	28480	5041-2009
15	5041-0797	5	1	KEY CAP-P2	28480	5041-0797
16	5041-2800	5	1	KEY CAP-BYPASS	28480	5041-2800
17	5041-2017	6	1	KEY CAP-ROTATE	28480	5041-2017
18	5041-2010	9	1	KEY CAP-ALL PENS	28480	5041-2010
19	5041-0055	8	1	KEY CAP-PEN SELECT #1	28480	5041-0055
20	5041-0056	9	1	KEY CAP-PEN SELECT #2	28480	5041-0056
21	5041-0057	0	1	KEY CAP-PEN SELECT #3	28480	5041-0057
22	5041-0058	1	1	KEY CAP-PEN SELECT #4	28480	5041-0058
23	5041-2015	4	1	KEY CAP-PEN SPEED	28480	5041-2015
24	5041-0062	7	1	KEY CAP-PEN UP	28480	5041-0062
25	5041-1941	3	1	KEY CAP-PEN SELECT #5	28480	5041-1941
26	5041-1942	4	1	KEY CAP-PEN SELECT #6	28480	5041-1942
27	5041-1943	5	1	KEY CAP-PEN SELECT #7	28480	5041-1943
28	5041-1944	6	1	KEY CAP-PEN SELECT #8	28480	5041-1944
29	5041-2016	5	1	KEY CAP-PEN FORCE	28480	5041-2016
30	5041-0061	6	1	KEY CAP-PEN DOWN	28480	5041-0061
31	07580-60157	6	1	PANEL-FRONT (RH)	28480	07580-60157
32	07580-60127	9	1	CASE-TOP (RH) FRONT PANEL COVER	28480	07580-60127
33	0380-0175	6	5	STANDOFF-HEX .375-IN-LG 6-32THD	00000	ORDER BY DESCRIPTION
34	07585-60264	0	1	FRONT PANEL (PCA)	28480	07585-60264
35	07580-60058	5	1	CONTROL STICK ASSEMBLY	28480	07580-60058
				MISCELLANEOUS		
	07580-40120	0	1	WINDOW-LED	28480	07580-40120
	3030-0948	3	4	SCREW-HEX	28480	3030-0948

Table 4-17. Parts List, Electronics Enclosure Assembly — Model 7580B

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
1	3101-2667	8	1	SWITCH—LINE POWER	28480	3101-2667
2	2360-0117	6	43	SCREW—MACH 6-32 .375-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
3	07580-00126	2	1	PANEL—POWER SWITCH, MKD	28480	07580-00126
4	07580-60340	8	1	COVER—CASE FRONT	28480	07580-60340
5	3131-0474	4	1	BEZEL—POWER SWITCH	28480	3131-0474
6	07580-60104	2	1	PCA—POWER SUPPLY	28480	07580-60104
7	07580-60056	3	1	CABLE ASSEMBLY—POWER SUPPLY	28480	07580-60056
8	2580-0003	5	4	NUT—HEX—W/LKWR 8-32-THD .125-IN-THK	00000	ORDER BY DESCRIPTION
9	07580-00077	2	1	MOUNT—TRANSFORMER	28480	07580-00077
10	9100-4148	8	1	TRANSFORMER—POWER	28480	9100-4148
11	2360-0183	6	4	SCREW—MACH 6-32 .375-IN-LG 82 DEG	00000	ORDER BY DESCRIPTION
12	07580-00195	5	1	SUPPORT, FRONT CHASSIS (LH)	28480	07580-00195
13	07580-60350	5	1	ELECTRONIC CASE ASSEMBLY	28480	07580-60350
14	07580-60103	1	1	PCA—TRANSISTOR (MOTOR DRIVE)	28480	07580-60103
15	0380-0091	5	4	STANDOFF—HEX .75-IN-LG 6-32THD	00000	ORDER BY DESCRIPTION
16	07580-00197	7	1	SUPPORT BRACKET, CASE	28480	07580-00197
17	07580-60067	6	1	CABLE—MAIN INTERCONNECT	28480	07580-60067
18	07580-60423	8	1	CABLE—POWER SWITCH	28480	07580-60423
19	07580-60425	0	1	CABLE—NEUTRAL FUSE	28480	07580-60425
20	0590-0381	1	14	NUT—HEX—W/LKWR 6-32-THD .12-IN-THK	00000	ORDER BY DESCRIPTION
21	3050-0066	8	2	WASHER—FL MTL NO. 6 .147-IN-ID	00000	ORDER BY DESCRIPTION
22	07580-60429	4	1	CABLE—PANEL TO PANEL GROUND	28480	07580-60429
23	2190-0008	3	7	WASHER—LK EXT NO. 6 .141-IN-ID	00000	ORDER BY DESCRIPTION
24	07580-00139	7	1	PANEL—VOLTAGE SELECTOR, MKD	28480	07580-00139
25	2420-0001	5	2	NUT—HEX—W/LKWR 6-32-THD .109-IN-THK	00000	ORDER BY DESCRIPTION
26	0400-0085	1	1	RING, INSERT	28480	0400-0085
27	0380-0009	5	5	STANDOFF—HEX 1.062-IN-LG 6-32THD	00000	ORDER BY DESCRIPTION
28	07580-60232	7	1	PCA—PRIMARY POWER	28480	07580-60232
29	9135-0242	8	1	POWER LINE FILTER	28480	9135-0242
30	2190-0315	5	2	WASHER—FL MTL NO. 5 .13-IN-ID .25-IN-OD	00000	ORDER BY DESCRIPTION
31	2260-0009	3	2	NUT—HEX—W/LKWR 4-40-THD .094-IN-THK	00000	ORDER BY DESCRIPTION
32	07580-60434	1	1	CABLE AY, AC GROUND	28480	07580-60434
33	07580-00196	6	1	SUPPORT—INNER PCA	28480	07580-00196
34	0380-0093	7	2	STANDOFF—HEX .5-IN-LG 6-32THD .25-IN-A/F	00000	ORDER BY DESCRIPTION
35	2200-0111	2	12	SCREW—MACH 4-40 .5-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
36	07580-60105	3	1	PCA—MAIN INTERCONNECT	28480	07580-60105
37	2360-0113	2	30	SCREW—MACH 6-32 .25-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
38	07580-00042	1	1	CHASSIS—PCA INTERCONNECT	28480	07580-00042
39	07580-00198	8	1	SUPPORT, FRONT CHASSIS (RH)	28480	07580-00198
40	0403-0406	6	8	GUIDE—PCA BOARD	28480	0403-0406
41	07580-60341	9	1	COVER—BACK CASE	28480	07580-60341
42	07585-60068	2	1	CABLE—EXTERNAL I/O GROUND	28480	07585-60068
43	07580-60398	6	1	COVER—MAIN POWER, MKD	28480	07580-60398
44	3050-0100	1	4	WASHER—FL MTL NO. 4 .117-IN-THK	00000	ORDER BY DESCRIPTION
45	2190-0074	3	2	WASHER—LK HLCL NO. 10 .194-IN-ID	00000	ORDER BY DESCRIPTION
46	0380-0644	4	2	STANDOFF—HEX .327-IN-LG 6-32THD	00000	ORDER BY DESCRIPTION
47	1251-7829	9	4	STANDOFF	28480	1251-7829
48	2190-0108	4	4	WASHER—LK HLCL NO. 4 .115-IN-ID	00000	ORDER BY DESCRIPTION
49	07585-00167	6	1	PANEL, DUAL I/O (MKD)	28480	07585-00167
50	07585-00152	9	1	PANEL, SUB (DUAL I/O)	28480	07585-00152
51	07580-20185	5	1	BEZEL—SWITCH	28480	07580-20185
52	0380-0002	8	4	SPACER—RND .25-IN-LG .156-IN-ID	00000	ORDER BY DESCRIPTION
53	07585-60263	9	1	PCA—REAR PANEL, HP-IB/RS-232-C (DUAL I/O)	28480	07585-60263
54	07585-60154	7	1	CABLE AY—EXTERNAL I/O	28480	07585-60154
55	6960-0004	6	1	PLUG—DOMED	28480	6960-0004
56	0624-0505	4	2	SCREW—TAPPING 6-32 .500-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
57	07580-60426	1	1	CABLE AY—VOLTAGE SELECTOR	28480	07580-60426
58	07580-60427	2	1	CABLE AY—FAN	28480	07580-60427
59	07580-00194	4	1	PCA RETAINER	28480	07580-00194
60	0360-1859	3	1	TERMINAL—SOLDER LUG PL-MTG	28480	0360-1859
61	2110-0569	3	1	NUT—FUSEHOLDER THREAD—M 12.7 X 1.5 DBL	28480	2110-0569
62	07580-60424	9	1	CABLE AY—LINE FUSE	28480	07580-60424
63	2110-0566	0	1	FUSEHOLDER—EXTR POST 12A 250V	28480	2110-0566
64	2200-0103	2	2	SCREW—MACH 4-40 .25-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
65	07580-00132	0	1	PLATE—VOLTAGE ID, MKD (100V/120V)	28480	07580-00132
	07580-00133	1	1	PLATE—VOLTAGE ID, MKD (220V/240V)	28480	07580-00133
66	2110-0380	6	1	FUSE—2.5A 250V SLO-BLO 1.25 X .25 IEC	28480	2110-0380
	2110-0495	4	1	FUSE—1.6A 250V SLO-BLO IEC	28480	2110-0495
67	2110-0567	1	1	CAP—FUSEHOLDER, BAYONET 12A 250V MAX (100V/120V)	28480	2110-0567
	2110-0565	9	1	CAP—FUSEHOLDER, BAYONET 12A 250V MAX (220V/240V)	28480	2110-0565
68	07580-00135	3	2	SHIELD, RIBBON CABLE	28480	07580-00135
				NOTES		
				THE POWER TRANSFORMER ASSY CONTAINING ITEMS 8 THRU 10 MAY BE ORDERED USING HP P/N 07580-60075.		
				THE HP-IB/RS-232-C (DUAL I/O) REAR PANEL ASSY CONTAINING ITEMS 20, 45 THRU 53, AND 68 MAY BE ORDERED USING HP P/N 07585-60155.		

Table 4-18. Parts List, Pen, Media, and Motor Drive Mechanics — Model 7580B

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
1	2360-0117	6	1	SCREW-MACH 6-32 .375-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
2	07580-60070	1	1	CABLE ASSEMBLY-FRONT SENSOR	28480	07580-60070
3	07580-60069	8	1	CABLE ASSEMBLY-REAR SENSOR	28480	07580-60069
4	07580-60066	5	1	CABLE ASSEMBLY-MICROSWITCH (PRIMARY)	28480	07580-60066
5	07580-60116	6	1	PCA-SENSOR INTERCONNECT	28480	07580-60116
6	07580-00096	5	1	END PLATE-STABLE	28480	07580-00096
7	1400-0584	6	13	MOUNT-CA TIE .122-DIA .75-WD ABS	28480	1400-0584
8	07580-20083	2	1	PLATE-STABLE DRIVE	28480	07580-20083
9	2260-0001	5	1	NUT-HEX-DBL-CHAM 4-40-THD .094-IN-THK	28480	2260-0001
10	07580-40054	9	1	MOUNT-SENSOR, CAROUSEL POSITION	28480	07580-40054
11	2190-0315	5	2	WASHER-FL MTLC NO. 5 .13-IN-ID .25-IN-OD	28480	2190-0315
12	2200-0107	6	6	SCREW-MACH 4-40 .375-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
13	07580-60119	9	1	PCA-CAROUSEL SENSOR	28480	07580-60119
14	1990-0650	6	1	SENSOR-CAROUSEL (PHOTO DEVICE)	28480	1990-0650
15	2200-0111	2	7	SCREW-MACH 4-40 .5-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
16	07580-60065	4	1	MOTOR ASSEMBLY-CAROUSEL	28480	07580-60065
17	2360-0123	4	4	SCREW-MACH 6-32 .625-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
18	3050-0066	8	13	WASHER-FL MTLC NO. 6 .147-IN-ID	28480	3050-0066
19	3140-0674	5	1	MOTOR-PINCH ROLLER	28480	3140-0674
20	07580-20145	7	2	SCREW-MOUNTING PINCH ROLLER MOTOR	28480	07580-20145
21	0905-0932	7	1	O-RING-STABLE ADAPTOR	83259	2-004 C873 7G
22	07585-20011	1	8	STABLE ADAPTOR ASSEMBLY	28480	07585-20011
23	3030-0009	7	1	SCREW-SET 6-32 .375-IN-LG SMALL CUP-PT	00000	ORDER BY DESCRIPTION
24	3030-0033	7	4	SCREW-SET 6-32 .188-IN-LG SMALL CUP-PT	28480	3030-0033
25	2510-0107	3	7	SCREW-MACH 8-32 .5-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
26	2190-0087	8	21	WASHER-LK HLCL NO. 8 .168-IN-ID	28480	2190-0087
27	3050-0019	1	2	WASHER-FL MTLC NO. 10 .2-IN-ID .5-IN-OD	28480	3050-0019
28	07585-20303	4	1	Y-ARM MOUNTING PLATE (LH)	28480	07585-20303
29	1600-1103	1	*	SHIM-Y-ARM (LEFT) THIN	28480	1600-1103
	1600-1281	6	*	SHIM-Y-ARM (LEFT) THICK	28480	1600-1281
30	0520-0128	7	1	SCREW-MACH 2-56 .25-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
31	07580-00088	5	1	PLATE-CAROUSEL MOTOR	28480	07580-00088
32	07580-60101	9	1	PCA-FRONT SENSOR	28480	07580-60101
33	07580-60102	0	1	PCA-REAR SENSOR	28480	07580-60102
34	07580-60051	8	1	CABLE ASSEMBLY-GROUND	28480	07580-60051
35	07580-40051	6	1	BRACKET-PIVOT FORK	28480	07580-40051
36	1460-1871	2	1	SPRING-EXT 11-MM-OD SST	28480	1460-1871
37	07580-40053	8	1	FORK-STABLE CUP	28480	07580-40053
38	07580-20163	9	1	SHAFT-FORK	28480	07580-20163
39	07585-20254	4	1	SIDE PLATE ASSEMBLY (LH)	28480	07585-20254
40	3030-0602	6	1	SCREW-SET 6-32 .25-IN-LG CUP-PT ALY STL	00000	ORDER BY DESCRIPTION
41	1410-0012	6	2	BRG-RDL BA .375-IN-ID .875-IN-OD	28480	1410-0012
42	2190-0142	6	7	WASHER-FL MTLC NO. 6 .156-IN-ID .5-IN-OD	28480	2190-0142
43	07580-60041	6	2	PULLEY ASSEMBLY-IDLER	28480	07580-60041
44	07580-20022	9	1	BOLT (IDLER PULLEY)	28480	07580-20022
45	07580-20021	8	1	SPACER-IDLER	28480	07580-20021
46	07580-60253	2	1	CENTER PLATEN ASSEMBLY	28480	07580-60253
47	07580-20159	3	1	AXLE-ACTUATOR	28480	07580-20159
48	0510-0083	2	2	RETAINER-RING E-R EXT .25-IN-DIA STL	28480	0510-0083
49	3050-0470	8	2	WASHER-FL MTLC 1/4 IN .281-IN-ID	28480	3050-0470
50	07580-40052	7	1	ACTUATOR-STABLE CUP	28480	07580-40052
51	2510-0123	3	2	SCREW-MACH 8-32 .5-IN-LG 82 DEG	00000	ORDER BY DESCRIPTION
52	07585-20302	3	1	SIDEPLATE-SUB	28480	07585-20302
53	2680-0179	8	2	SCREW-MACH 10-24 .5-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
54				NOT ASSIGNED		
55	07580-60375	3	1	BRIDGE-PINCH ROLLER ASSEMBLY	28480	07580-60375
56				NOT ASSIGNED		
57	07585-40106	7	1	LIFT ARM-PINCH ROLLER (L.H.)	28480	07585-40106
58	07580-60250	9	1	Y-ARM ASSEMBLY	28480	07580-60250
59	2190-0105	1	11	WASHER-LK HLCL NO. 6 .141-IN-ID	28480	2190-0105
60	2510-0109	5	3	SCREW-MACH 8-32 .625-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
61	07585-40104	5	2	SHIELD-SLOT	28480	07585-40104
62	2510-0111	9	4	SCREW-MACH 8-32 .75-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
63	07580-20129	7	1	CAM-PAPER STOP	28480	07580-20129
64	07580-60246	3	1	SHAFT-PINCH WHEEL	28480	07580-60246
65	1410-0945	4	2	BEARING-SLEEVE .250-ID .297-OD	28480	1410-0945
66	1460-1868	7	2	SPRING-CPRSN 8.6-MM-OD 19.4-MM-OA-LG MUW	28480	1460-1868
67	07585-20305	6	1	PAPER STOP	28480	07585-20305
68	07585-20311	4	1	SHAFT-PIVOT	28480	07585-20311
69	0624-0098	0	1	SCREW-TPG 4-40 .438-IN-LG PAN-HD-POZI	28480	0624-0098
70	07585-20310	3	1	ACTUATOR-ALIGNMENT STOP	28480	07585-20310
71	07585-40103	4	1	FOLLOWER-CAM	28480	07585-40103
72	07585-40105	6	1	CAM-MICROSWITCH, PINCH WHEEL	28480	07585-40105
73	07585-20315	8	2	CLAMP-MICROSWITCH	28480	07585-20315
74	07585-00240	6	1	MOUNT-ADJUSTMENT	28480	07585-00240
75	0520-0164	1	2	SCREW-MACH 2-56 .25-IN-LG 82 DEG	00000	ORDER BY DESCRIPTION

Table 4-18. Parts List, Pen, Media, and Motor Drive Mechanics — Model 7580B (Continued)

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
76	07580-60084	7	1	COVER-PEN LIFT PLATE	28480	07580-60084
77	07580-60013	2	1	PEN CARRIAGE ASSEMBLY (INC. TRAILING CABLE	28480	07580-60013
78	2360-0210	0	2	SCREW-MACH 6-32 .625-IN-LG 82 DEG	00000	ORDER BY DESCRIPTION
79	0510-0533	7	2	RETAINER-RING E-R EXT .375-IN-DIA SST	28480	0510-0533
80	07580-20020	7	1	SHAFT, Y-PULLEY	28480	07580-20020
81	1410-1121	0	2	BEARING-THRUST .751-ID	28480	1410-1121
82	07580-20019	4	1	BOBBIN, Y-DRIVE CABLE	28480	07580-20019
83	07580-60015	4	1	CABLE ASSEMBLY, Y-DRIVE	28480	07580-60015
84	07580-20073	0	1	GEAR, Y-DRIVE (SPUR)	28480	07580-20073
85	2510-0115	3	2	SCREW-MACH 8-32 1-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
86	3050-0139	6	2	WASHER-FL MTLC NO. 8 .172-IN-ID	28480	3050-0139
87	2510-0302	0	3	SCREW-MACH 8-36 .75-IN-LG PAN-HD-SLT	00000	ORDER BY DESCRIPTION
88	07580-40019	6	1	LINK, Y-EXPANSION	28480	07580-40019
89	07580-20162	8	2	NUT-ADJUSTMENT	28480	07580-20162
90	07580-20161	7	2	SCREW-ADJUSTMENT	28480	07580-20161
91	07580-20165	1	2	BUSHING-PIVOT	28480	07580-20165
92	2190-0882	1	6	WASHER-FL MTLC NO. 8 .188-IN-ID	28480	2190-0882
93	07580-20029	6	1	DRIVE CASTING (MACHINED)	28480	07580-20029
94	07580-20026	3	1	BRACKET-PIVOT	28480	07580-20026
95	1460-1902	0	4	SPRING-EXT .5-IN-OD MUW	28480	1460-1902
96	07585-20321	6	2	THUMB SCREW-PINCH ROLLER	28480	07585-20321
97	07580-40006	1	2	YOKE-PINCH ROLLER	28480	07580-40006
98	3030-0007	5	4	SCREW-SET 4-40 .125-IN-LG SMALL CUP-PT	00000	ORDER BY DESCRIPTION
99	07580-20175	3	2	AXLE-PINCH ROLLER	28480	07580-20175
100	07580-20141	3	2	AXLE-LIFT ARM	28480	07580-20141
101	07580-60099	4	2	PINCH WHEEL SUB-ASSEMBLY	28480	07580-60099
102	0510-0015	0	4	RETAINER-RING E-R EXT .125-IN-DIA STL	28480	0510-0015
104	9160-0263	6	1	MAGNET-SENSOR (REED SWITCH)	28480	9160-0263
105	07585-40107	8	1	LIFT ARM-PINCH ROLLER (RH) MKD	28480	07585-40107
106	2200-0167	8	4	SCREW-MACH 4-40 .375-IN-LG 82 DEG	28480	2200-0167
107	1531-0202	2	1	MOTOR MOUNT Y-AXIS	28480	1531-0202
108	1251-2619	5	1	CONNECTOR 4-PIN M UTILITY	28480	1251-2619
109	07580-20192	4	1	BRACKET-FORK, MACHINED	28480	07580-20192
110	07580-60016	5	2	MOTOR-DRIVE ASSEMBLY	28480	07580-60016
111	2190-0871	8	8	WASHER-SPR CRVD 1/4 IN .265-IN-ID	28480	2190-0871
112	07580-20151	5	3	SCREW-SHOULDERED	28480	07580-20151
113	1251-6880	0	1	CONNECTOR 4-PIN M UTILITY	28480	1251-6880
114	**	2	1	SCREW-SKT HD CAP 4-40 .125-IN-LG	28480	**
115	2360-0133	6	2	SCREW-MACH 6-32 1.25-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
116	07580-40018	5	1	LINK, X-EXPANSION	28480	07580-40018
117	1531-0201	1	1	MACHINED PART-AL MOTOR MOUNT-Y	28480	1531-0201
118	**	2	4	NUT-GRIT WHEEL	28480	**
119	07580-20018	3	1	CLAMP, X-MOTOR	28480	07580-20018
120	07580-20017	2	1	SPUR GEAR-X	28480	07580-20017
121	07580-20265	2	3	SPACER, X-MOTOR PLATE	28480	07580-20265
122	2360-0201	9	4	SCREW-MACH 6-32 .5-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
123	07585-20253	3	1	SIDE PLATE ASSEMBLY (RH)	28480	07585-20253
124	1600-1282	7	*	SHIM, Y-ARM (RT) THIN	28480	1600-1282
	1600-1283	8	*	SHIM, Y-ARM (RT) THICK	28480	1600-1283
125	2580-0003	5	1	NUT-HEX-W/LKWR 8-32-THD .125-IN-THK	00000	ORDER BY DESCRIPTION
126	3030-0849	3	1	SCREW-SET 8-32 .875-IN-LG SMALL CUP-PT	00000	ORDER BY DESCRIPTION
127	**	2	1	SHAFT-DRIVE (GRIT WHEEL)	28480	**
128	**	2	1	BLOCK MOUNTING ASSEMBLY (RH)	28480	**
129	**	2	1	GRIT WHEEL SUB ASSEMBLY (MATCHED)	28480	**
130	**	2	1	SHAFT-GRIT WHEEL	28480	**
131	**	2	2	BLOCK-MOUNTING ASSEMBLY	28480	**
132	**	2	1	WASHER-GRIT WHEEL	28480	**
133	**	2	2	SCREW-MACH 8-32 .375-IN-LG PAN-HD-POZI	28480	**
134	**	2	1	RETAINER; THERMOPILE RING	28480	**
135	2360-0121	2	6	SCREW-MACH 6-32 .5-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
136	07585-60118	3	1	PCA-PAPER SENSOR ASSEMBLY	28480	07585-60118
137	07580-40032	3	1	PLATE-BAFFLE	28480	07580-40032
138	0340-0940	9	1	INSULATOR DMP CMPD	28480	0340-0940
139	07580-00032	9	1	MOUNTING-PLATE (FAN)	28480	07580-00032
140	3160-0315	3	1	FAN-TBAX 105-CFM 100-125V 50-60-HZ	28480	3160-0315
141	2360-0318	9	4	SCREW-MACH 6-32 1.875-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
142	3050-0794	9	4	WASHER-FL NM NO. 6 .14-IN-ID .406-IN-OD	28480	3050-0794
143	0905-0913	4	1	GASKET SQ NPRN SPNG .063-THK 4.125-LG	28480	0905-0913
144	07580-00081	8	1	COVER-PAPER SENSOR	28480	07580-00081
145	0460-1416	0	1	TAPE-INDL 2-IN-WD .25-IN-T POLYU-FM ACRL	28480	0460-1416
146	07585-20313	6	1	BUSHING, ADJUST	28480	07585-20313
147	0590-0076	1	1	NUT-HEX-PLSTC LKG 4-40-THD .143-IN-THK	28480	0590-0076
148	07580-60038	1	1	CABLE-ACTUATOR ASSEMBLY	28480	07580-60038
149	07580-60008	5	1	BRACKET-DRIVE CABLE ASSEMBLY	28480	07580-60008
150	3101-2626	9	1	SWITCH-SENS SPDT SUBMIN 1A 30VDC	28480	3101-2626

Table 4-18. Parts List, Pen, Media, and Motor Drive Mechanics — Model 7580B (Continued)

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
151	07585-00164	3	1	SPACER-MICROSWITCH	28480	07585-00164
152	07585-20308	9	1	CHANNEL-TRAILING CABLE	28480	07585-20308
153	1400-0900	0	2	CLAMP-FL-CA .03-.25-DIA .5-WD NORYL	28480	1400-0900
154	2360-0205	3	5	SCREW-MACH 6-32 .75-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
155	1460-1977	9	1	SPRING-EXT .3-IN-OD SST	28480	1460-1977
156	3050-0016	8	2	WASHER-FL MTLN NO. 6 .147-IN-ID	28480	3050-0016
157	07585-40100	1	1	MOUNT-PAPER SENSOR	28480	07585-40100
158	3050-0958	7	2	WASHER-SPR CRVD .269-IN-ID .423-IN-OD	28480	3050-0958
159	2200-0169	0	6	SCREW-MACH 4-40 .5-IN-LG 82 DEG	28480	2200-0169
160	3160-0099	0	1	FAN GRILLE	28480	3160-0099
161	3030-0892	6	1	SCREW-SET 10-24 .375-IN-LG CUP-PT SST	00000	ORDER BY DESCRIPTION
162	2360-0115	4	2	SCREW-MACH 6-32 .312-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
163	07585-40101	2	1	SUPPORT-CAM SHAFT	28480	07585-40101
164	07585-20212	4	1	PIN-SUPPORT	28480	07585-20212
165	07585-20309	0	1	MOUNTING PLATE-ADJUST	28480	07585-20309
166	07585-20304	5	1	Y-ARM MOUNTING PLATE (RH)	28480	07585-20304
167	07585-00163	2	1	RETAINER-BAG	28480	07585-00163
168	07585-20318	1	1	BRACE-SIDEPLATE	28480	07585-20318
169	07585-20322	7	2	THRUST PAD	28480	07585-20322
170	3030-0013	3	1	SCREW-SKT HD CAP 6-32 .75-IN-LG ALY STL	00000	ORDER BY DESCRIPTION
171	2420-0003	7	2	NUT-HEX-DBL-CHAM 6-32-THD .094-IN-THK	28480	2420-0003
172	07580-40297	2	1	COVER-GEAR, MOTOR	28480	07580-40297
173	T96083	7	2	SCREW, SELF-TAPING 8-32 X .250-IN-LG	28480	T96083
174	T96084	9	6	SCREW, SELF-TAPING 8-32 X .325-IN-LG	28480	T96084
175	07580-20260	7	2	WASHER-INSULATING	28480	07580-20260
176	2360-0219	9	3	SCREW 6-32 X 1.375 IN-LG	00000	ORDER BY DESCRIPTION
177	07580-20260	7	3	WASHER-SHOULDER	28480	07580-20260
178	07580-20261	8	1	CAP-SET SCREW	28480	07580-20261
<p>NOTES</p> <p>*QUANTITY OF SHIMS IS DEPENDENT ON ARM ADJUSTMENT AND MAY VARY FROM PLOTTER TO PLOTTER.</p> <p>THE DRIVE PULLEY AY CONTAINING ITEMS 15, 81, 82 & 84 MAY BE ORDERED USING HP P/N 07585-60042.</p> <p>THE LEFT HAND PINCH WHEEL AY CONTAINING ITEMS 24, 57, 95 THRU 103 & 169 MAY BE ORDERED USING HP P/N 07585-60133.</p> <p>THE RIGHT HAND PINCHWHEEL AY CONTAINING ITEMS 24, 95 THRU 105 & 169 MAY BE ORDERED USING HP P/N 07585-60134.</p> <p>**THE GRITWHEEL AY CONTAINING ITEMS 114, 118 & 127 THRU 134 SHOULD BE ORDERED</p> <p>THE HP-IB/RS-232-C (DUAL I/O) REAR PANEL AY CONTAINING ITEMS 20, 45 THRU 53 AND 68 MAY BE ORDERED USING HP P/N 07585-60155.</p>						

Table 4-19. Parts List, Stand Assembly — Model 7580B

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
1	1492-0106	1	4	CASTER	28480	1492-0106
2	3030-0821	1	8	SCREW-SKT HD CAP 1/4-20 .875-IN-LG	00000	ORDER BY DESCRIPTION
3	2190-0431	6	12	WASHER-LK HLCL 1/4 IN .255-IN-ID	28480	2190-0431
4	07580-60128	0	2	FOOT	28480	07580-60128
5	07580-20152	6	2	LEG	28480	07580-20152
6	07580-00025	0	2	INSERT-OUTSIDE LEG	28480	07580-00025
7	07580-00130	8	1	TABLE-FRONT	28480	07580-00130
8	07580-00027	2	1	PLATEN-FRONT	28480	07580-00027
9	2360-0117	6	22	SCREW-MACH 6-32 .375-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
10	07580-00028	3	1	PLATEN-REAR	28480	07580-00028
11	07580-00131	8	1	TABLE-REAR	28480	07580-00131
12	07580-00041	0	1	PAN-BASE	28480	07580-00041
13	3050-0066	8	22	WASHER-FL MTLC NO. 6 .147-IN-ID	28480	3050-0066
14	2360-0205	3	8	SCREW-MACH 6-32 .75-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
15	2190-0105	1	8	WASHER-LK HLCL NO. 6 .141-IN-ID	28480	2190-0105
16	07580-60125	7	2	CASE-BOTTOM	28480	07580-60125
17	2190-0074	3	8	WASHER-LK HLCL NO. 10 .194-IN-ID	28480	2190-0074
18	07580-60350	5	1	ELECTRONIC CASE ASSEMBLY	28480	07580-60350
19	2680-0105	0	8	SCREW-MACH 10-32 .625-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
20	07580-00026	1	1	INSERT-LEG BRACE	28480	07580-00026
21	07580-20154	8	1	BRACE-LEG	28480	07580-20154
22	07585-00200	8	1	BRACKET-TABLE, FRONT	28480	07585-00200
23	07580-00169	3	1	BRACE-TABLE, FRONT	28480	07580-00169
24	1492-0103	8	4	SWIVEL-STEM, CASTER	28480	1492-0103
25	3030-0929	0	6	SCREW-SKT FL HD CAP 6-32 .375-IN-LG 82	28480	3030-0929
26	07585-00265	5	2	BRACKET-TABLE, REAR	28480	07585-00265
27	2360-0121	2	8	SCREW-MACH 6-32 .5-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
28	3030-0952	9	4	SCREW-SET 1/4-20 2-IN-LG CUP-PT STL	28480	3030-0952
29	2950-0650	7	4	NUT-HEX, 1/4-20 THD .188-IN-THK	28480	2950-0650
30	07580-40062	9	2	PROTECTOR-FOOT	28480	07580-40062

Table 4-20. Parts List, Carriage and Y-Arm Cover Assemblies — Model 7580B

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
1	07580-40078	6	1	MOLDED WINDOW	28480	07580-40078
2	0624-0453	1	2	SCREW-TPG 2-28 .375-IN-LG PAN-HD-POZI	00000	0624-0453
3	07585-40016	8	1	ACTUATOR-MICROSWITCH	28480	07585-40016
4	0510-1268	7	1	RETAINER-RING CRSNT .236-IN-DIA STL	04858	0510-1268
5	07585-40079	3	2	BUMPER-RUBBER	28480	07585-40079
6	07585-60415	3	2	BLOCK-GUARD	28480	07585-60415
7	2360-0117	6	4	SCREW-MACH 6-32 .375-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
8	3050-0066	8	2	WASHER-FL MTLC NO. 6 .147-IN-ID	28480	3050-0066
9	1400-0584	6	2	MOUNTING PAD	00000	ORDER BY DESCRIPTION
10	07585-00160	9	1	MOUNT-MICROSWITCH, MAIN	28480	07585-00160
11	2200-0107	6	8	SCREW-MACH 4-40 .275-IN-LG PAN-HD-POZI	00000	2200-0107
12	07585-20254	4	1	SUPPORT-CHASSIS (LH)	28480	07585-20254
13	07585-60248	0	1	CABLE ASSY-MICROSWITCH (SUPPLEMENTARY)	28480	07585-60248
14	07585-00159	6	2	MOUNT-MICROSWITCH	28480	07585-00159
15	07580-60066	5	1	CABLE ASSEMBLY-MICROSWITCH (PRIMARY)	28480	07580-60066
16	0520-0173	2	4	SCREW-MACH 2-56 .188-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
17	3101-2626	9	2	SWITCH-SENS SPDT SUBMIN 1A 30VDC	28480	3101-2626
18	2190-0014	1	4	WASHER-LK INTL T NO. 2 .089-IN-ID	28480	2190-0014
19	0520-0129	8	4	SCREW-MACH 2-56 .312-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
20	07580-00246	7	1	COVER, Y-ARM	28480	07580-00246
21	07585-20253	3	1	SUPPORT-CHASSIS (RH)	28480	07585-20253
<p>NOTE</p> <p>ITEMS 1, 2, 3, 4, AND 5 MAY BE ORDERED AS AN ASSEMBLY USING HP PART NUMBER 07580-60178</p> <p>ALL ITEMS (EXCEPT 7, 8, 12 & 21) MAY BE ORDERED AS AN ASSEMBLY USING HP PART NUMBER 07580-60311</p>						

Table 4-21. Code List of Manufacturers

MFR. NO.	MANUFACTURER NAME	ADDRESS	ZIP CODE
00000	Any Satisfactory Supplier		
0003J	Nippon Electric Company		
00779	Amp, Inc.	Harrisburg, PA	17105
00853	Sangamo Electric Company, South Carolina Div.	Pickens, SC	29671
01121	Allen-Bradley Company	Milwaukee, WI	53204
01295	Texas Instruments, Inc., Semiconductor Component Div.	Dallas, TX	75222
0192B	RCA Corporation, Solid State Div.	Somerville, NJ	08876
02111	Spectrol Electronics Corp.	City of Industry, CA	91745
02114	Ferroxcube Corporation	Saugerties, NY	12477
03508	GE Company, Semiconductor Prod. Dept.	Syracuse, NY	13201
03888	KDI Pyrofilm Corporation	Whippany, NJ	07981
04713	Motorola Semiconductor Products	Phoenix, AZ	85062
07263	Fairchild Semiconductor Div.	Mountain View, CA	94042
11815	Cherry Rivet Div., Townsend Company	Santa Ana, CA	92707
13606	Sprague Electric Company, Semiconductor Div.	Concord, NH	03301
19701	Mepco/Electra Corporation	Mineral Wells, TX	76067
24355	Analog Devices, Inc.	Norwood, MA	02062
24546	Corning Glass Works (Bradford)	Bradford, PA	16701
24655	General Radio Co.	Concord, MA	01742
27014	National Semiconductor Corporation	Santa Clara, CA	95051
27167	Corning Glass Works (Wilmington)	Wilmington, NC	28401
28480	Hewlett-Packard Company, Corporate Headquarters	Palo Alto, CA	94304
32293	Intersil, Inc.	Cupertino, CA	95014
32694	Optron, Inc.	Carrollton, TX	75006
34649	Intel Corporation	Mountain View, CA	95051
56289	Sprague Electric Company	North Adams, MA	01247
72136	Electro Motive Corporation, Sub. IEC	Willimantic, CT	06226
75042	TRW, Inc., Philadelphia Div.	Philadelphia, PA	19108
83259	Parker Seal Co., Div. Parker-Hannifin	Culver City, CA	90231
84411	TRW, Capacitor Div.	Ogallala, NE	69153
86928	Seastrom Mfg. Co.	Glendale, CA	91201
91637	Dale Electronics, Inc.	Columbus, NE	68601

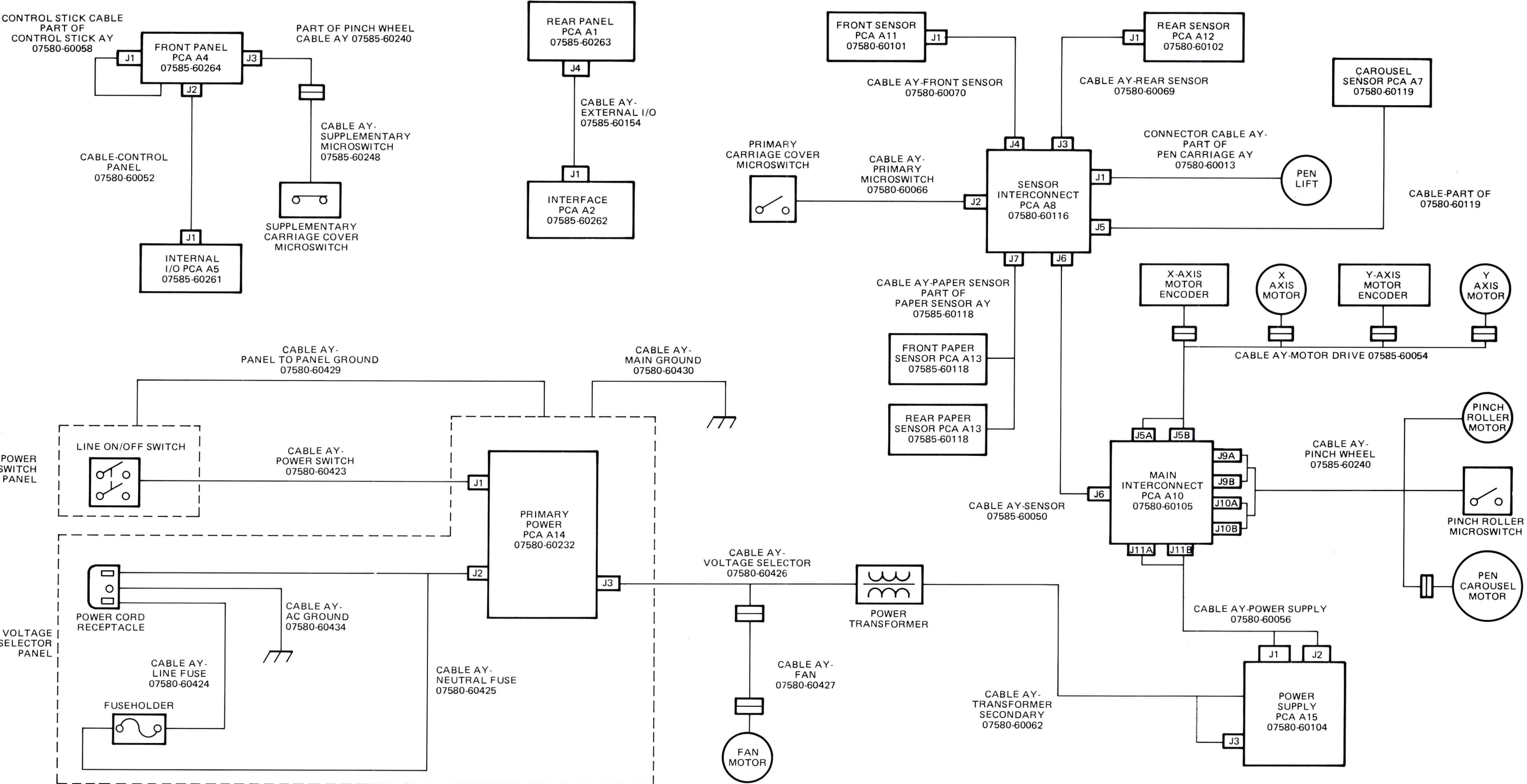


Figure 4-1. Interconnecting Cable Identification

REFER TO TABLE 4-16 FOR PARTS IDENTIFICATION OF ITEMS SHOWN IN FIGURE 4-2.

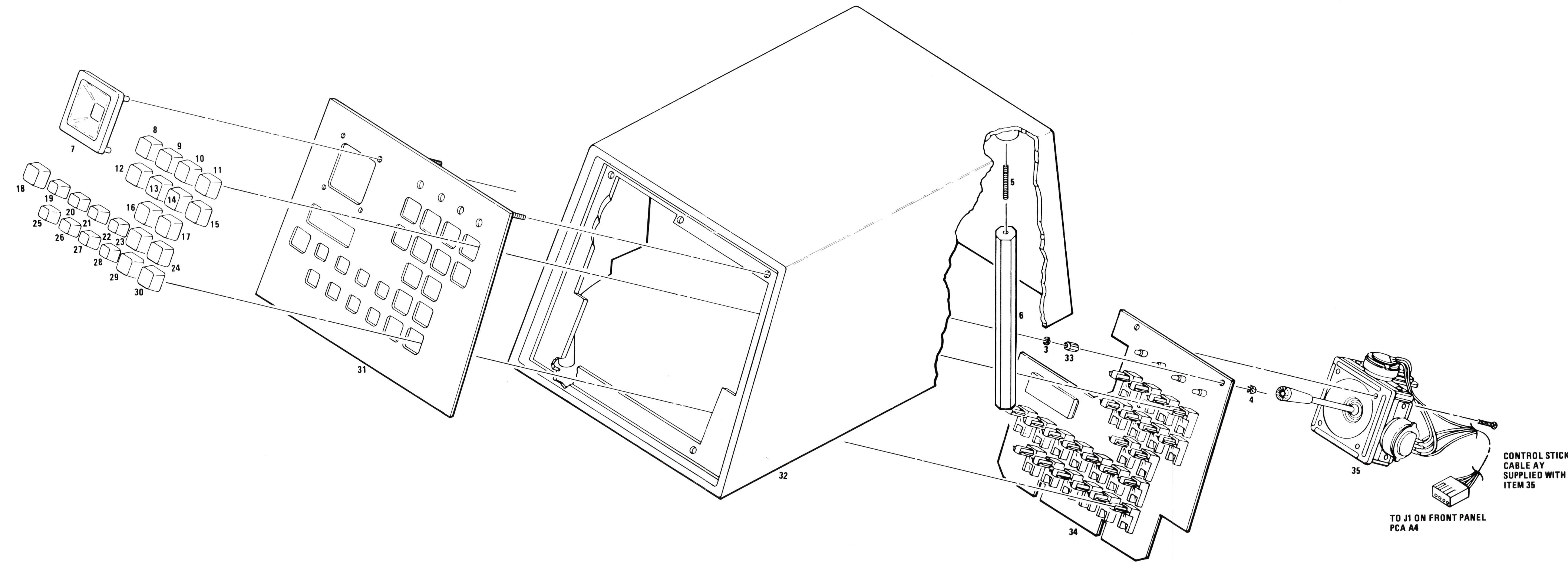
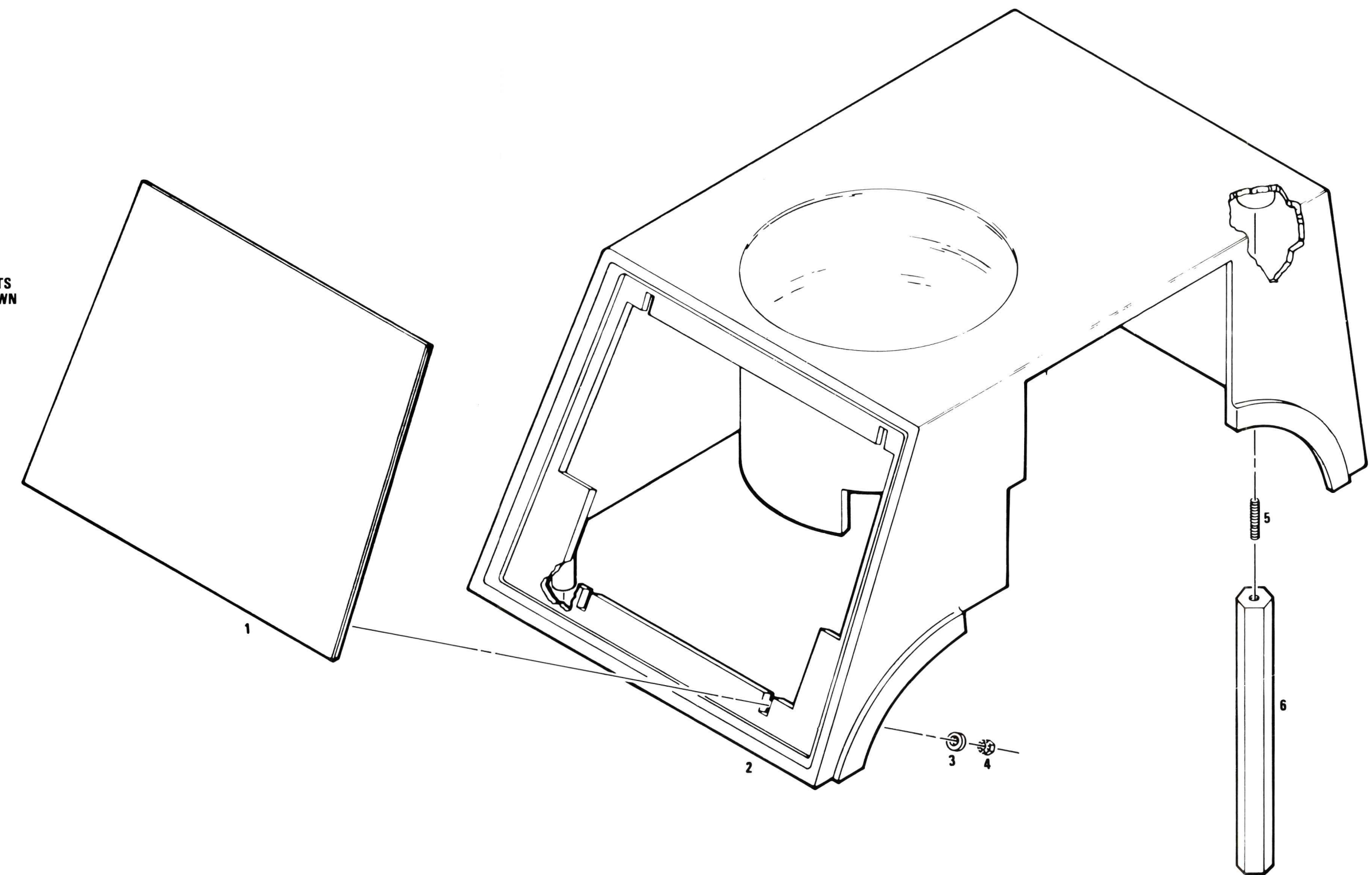


Figure 4-2. Front Panel and Carousel Cover Assemblies, Illustrated Parts Breakdown

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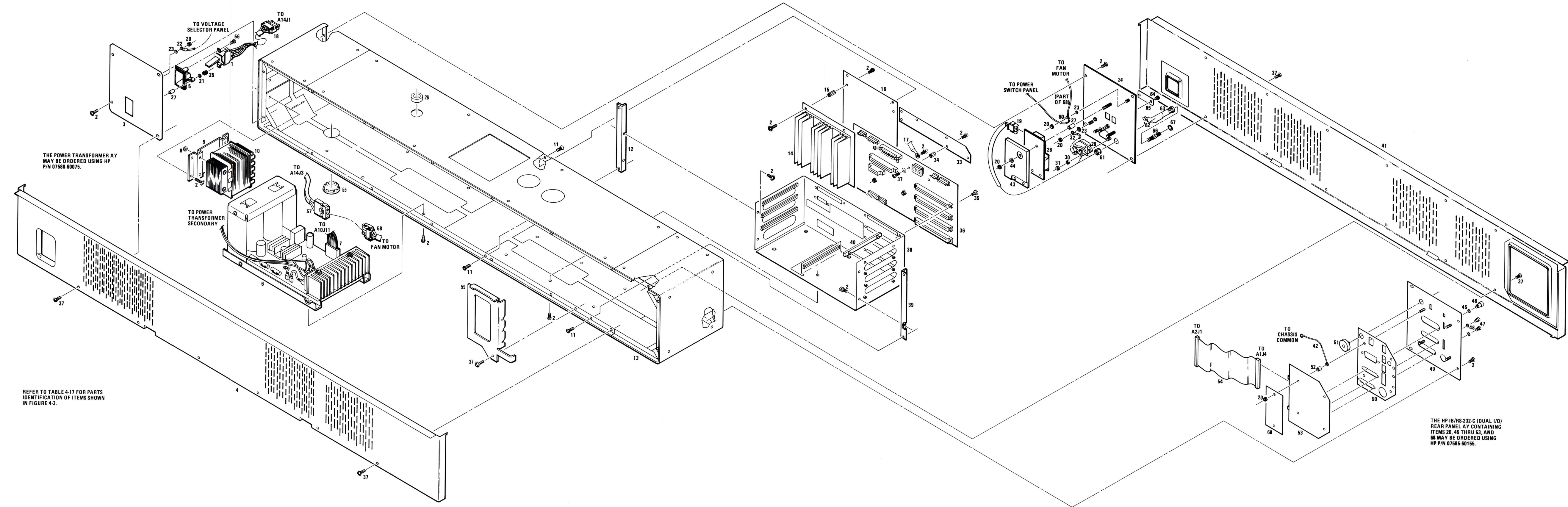


Figure 4-3. Electronic Enclosure Assembly, Illustrated Parts Breakdown

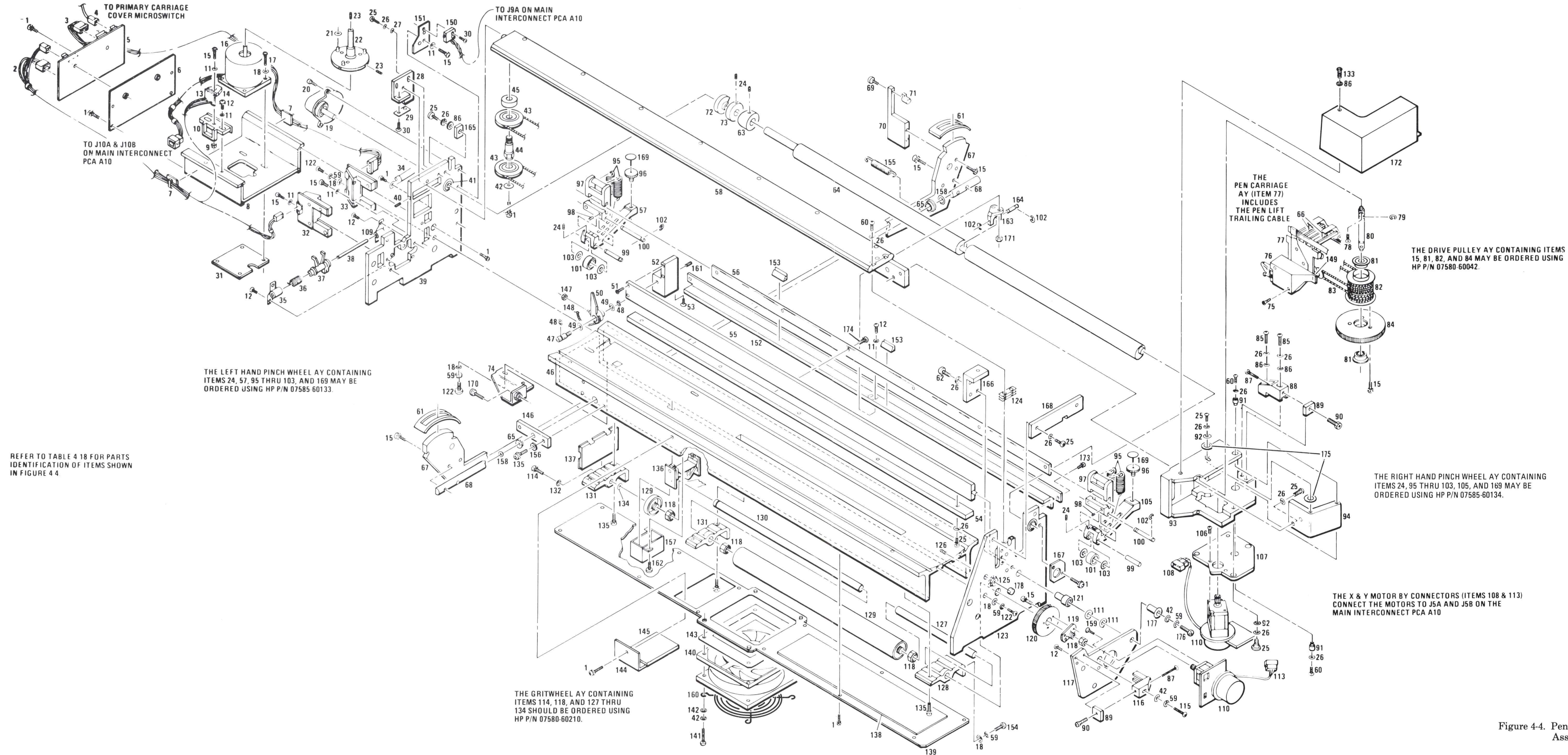
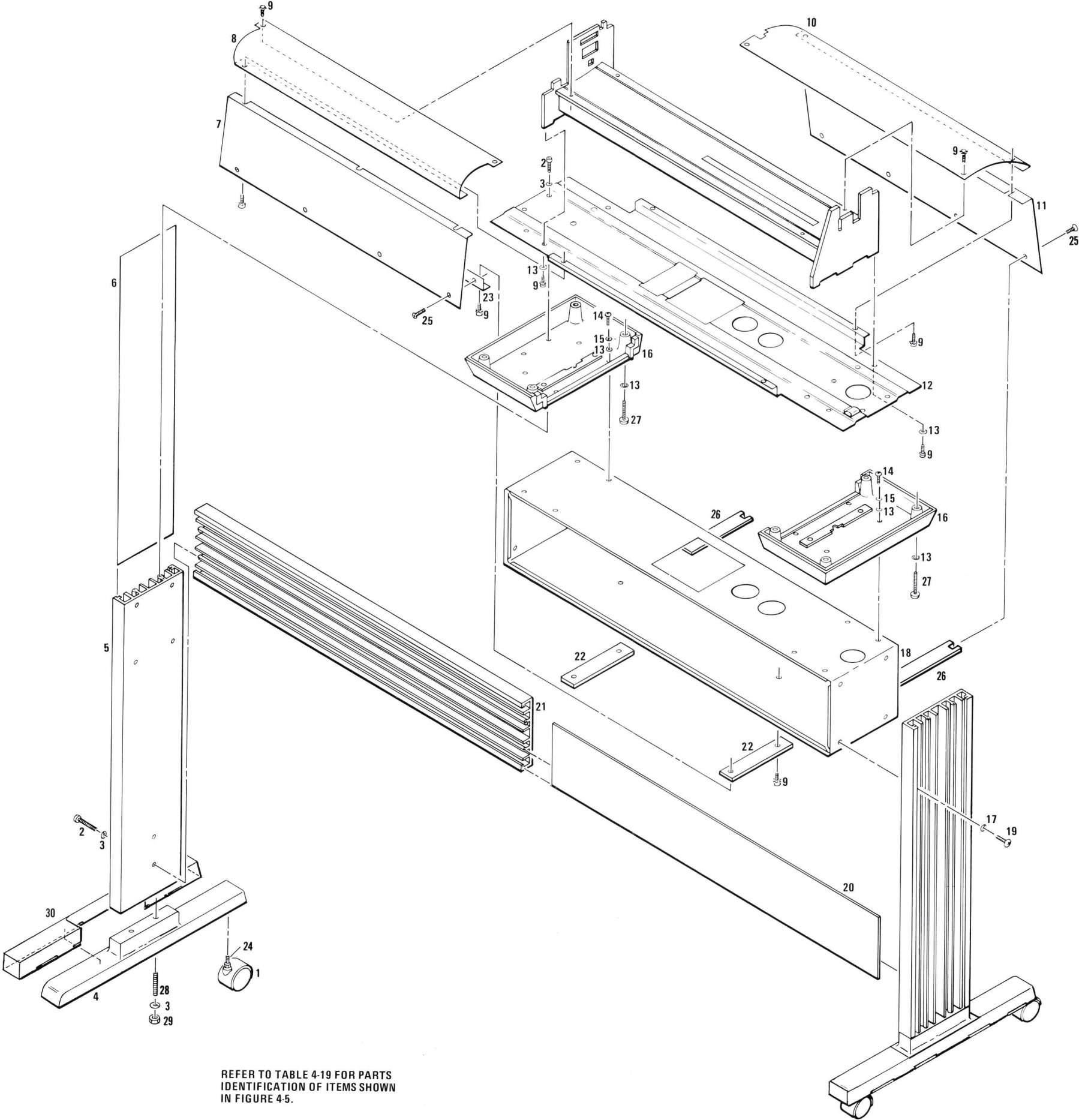


Figure 4-4. Pen, Media, and Motor Drive Mechanical Assemblies, Illustrated Parts Breakdown



REFER TO TABLE 4-19 FOR PARTS IDENTIFICATION OF ITEMS SHOWN IN FIGURE 4-5.

Figure 4-5. Stand Assembly, Illustrated Parts Breakdown

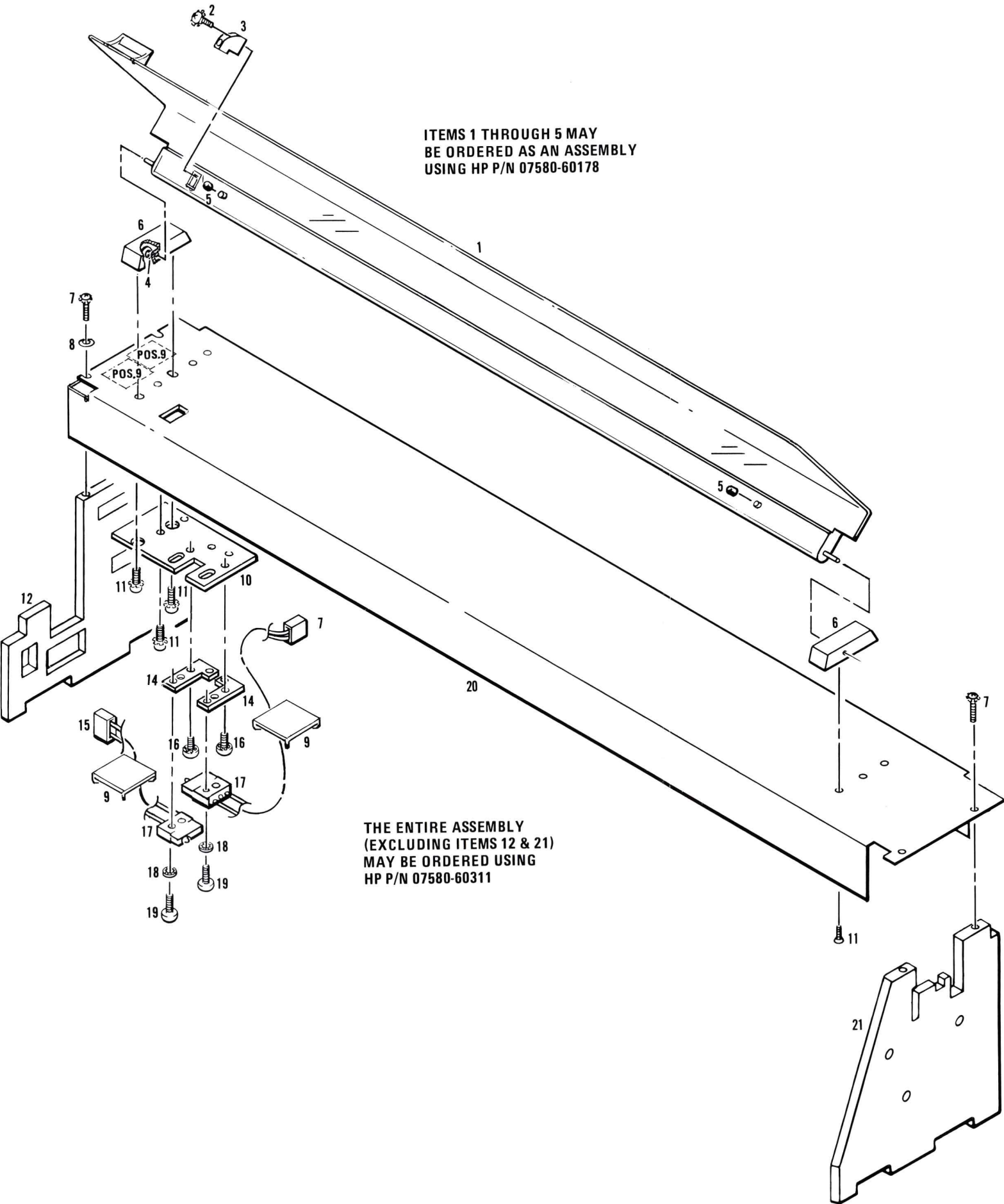


Figure 4-6. Carriage and Y-Arm Cover Assemblies,
Illustrated Parts Breakdown

SECTION V

PRODUCT HISTORY

5-1. INTRODUCTION

5-2. This section describes the differences between earlier models of the HP 7580B and the latest version documented in this manual. These earlier models are identified by their serial number prefix, and the date codes on their printed-circuit assemblies (PCAs). For ease of reference this section is divided into two major topics: History of Assemblies by Serial Number Prefix and History of Printed-Circuit Assemblies.

5-3. HISTORY OF ASSEMBLIES BY SERIAL NUMBER PREFIX

5-4. Table 5-1 is a quick-reference table that lists, by instrument serial number prefix, the assemblies that differ from those documented in this manual. Also referenced are Item Numbers under which these differences are described in this section.

Table 5-1. Assembly Reference by Serial Number Prefix

S/N PREFIX	ASSEMBLIES	ITEM(S)
2309	Rear Panel PCA (A1), External I/O PCA (A2), Processor PCA (A3), Internal I/O PCA (A5), Servo PCA (A6), Transistor PCA (A9) Pen, Media, and Motor Drive Mechanics; Pinch roller assembly; Electronics Enclosure assembly; Stand assembly; Front-Panel and Carousel Cover assemblies; Carriage and Y-Arm Cover assembly	SEE PCA HISTORY 1, 2, 3, 4, 5
2331	Rear Panel PCA (A1), External I/O PCA (A2), Processor PCA (A3), Servo PCA (A6), Transistor PCA (A9) Pen, Media, and Motor Drive Mechanics; Pinch roller assembly; Electronics Enclosure assembly; Stand assembly; Front-Panel and Carousel Cover assemblies; Carriage and Y-Arm Cover assembly	SEE PCA HISTORY 1, 2, 3, 4, 5
2334	Rear Panel PCA (A1), External I/O PCA (A2), Processor PCA (A3), Servo PCA (A6), Transistor PCA (A9) Pen, Media, and Motor Drive Mechanics; Electronics Enclosure assembly; Stand assembly; Front-Panel and Carousel Cover assemblies; Carriage and Y-Arm Cover assembly	SEE PCA HISTORY 2, 3, 4, 5
2335	Rear Panel PCA (A1), External I/O PCA (A2), Processor PCA (A3), Servo PCA (A6), Transistor PCA (A9) Pen, Media, and Motor Drive Mechanics; Electronics Enclosure assembly; Front-Panel and Carousel Cover assemblies; Carriage and Y-Arm Cover assembly	SEE PCA HISTORY 3, 4, 5

Table 5-1. Assembly Reference by Serial Number Prefix (Continued)

S/N PREFIX	ASSEMBLIES	ITEM(S)
2402	Processor PCA (A3), Servo PCA (A6), Transistor PCA (A9) Carriage and Y-Arm Cover assembly	SEE PCA HISTORY 4, 5
2444	Processor PCA (A3), Servo PCA (A6), Transistor PCA (A9) Carriage and Y-Arm Cover assembly	SEE PCA HISTORY 4, 5
2503	Processor PCA (A3), Servo PCA (A6), Transistor PCA (A9) Carriage and Y-Arm Cover assembly	SEE PCA HISTORY 4, 5
2548	Pen, Media, and Motor Drive Mechanics	5

5-5. Table 5-2 lists the assemblies, other than PCAs, that are described under each Item.

Table 5-2. Item Description

ITEM	ASSEMBLIES
1	Pen, Media, and Motor Drive Mechanics
2	Front-Panel and Pen Carousel Cover assemblies, Electronics Enclosure assembly, Stand assembly
3	Front-Panel and Pen Carousel Cover assemblies*; Pen, Media, and Motor Drive Mechanics*; Electronics Enclosure assembly*
4	Carriage and Y-Arm Cover assembly
5	Pen, Media, and Motor Drive Mechanics

*Assemblies were changed during production cycle.

5-6. Knowing the serial number prefix of the instrument, the user can find in Table 5-1 which assemblies are documented in this section. In Table 5-2 the user can find if more than one change has been made to the assembly in question and which items in this section to reference.

5-7. HISTORY OF PRINTED-CIRCUIT ASSEMBLIES

5-8. Hewlett-Packard's printed-circuit assemblies have two major identification features:

- Part Number.** All PCAs having the same part number are directly interchangeable. If a PCA is revised in any way that makes it non-interchangeable with previously issued PCAs of the same part number, a new part number is assigned to the revised PCA.
- Assembly Date Code.** The date code on the PCA is a four-digit number which identifies the assembly level by date code. The PCA date code is changed when a component or component part number is changed which alters the performance of the PCA. The first two digits represent the last two digits of the current year and are derived by subtracting 60 from the current year; the last two digits represent the week in that year, i.e. 2402 = second week in 1984. Any digits following a hyphen in the date code represent the division that manufactured the PCA.

5-9. Table 5-3 is a quick-reference table that lists PCAs by part number and date code. Listed next to the part number and date code of the PCAs are the Items located in this section that describe the differences between the PCA in question and the level of that PCA described in the main body of this manual.

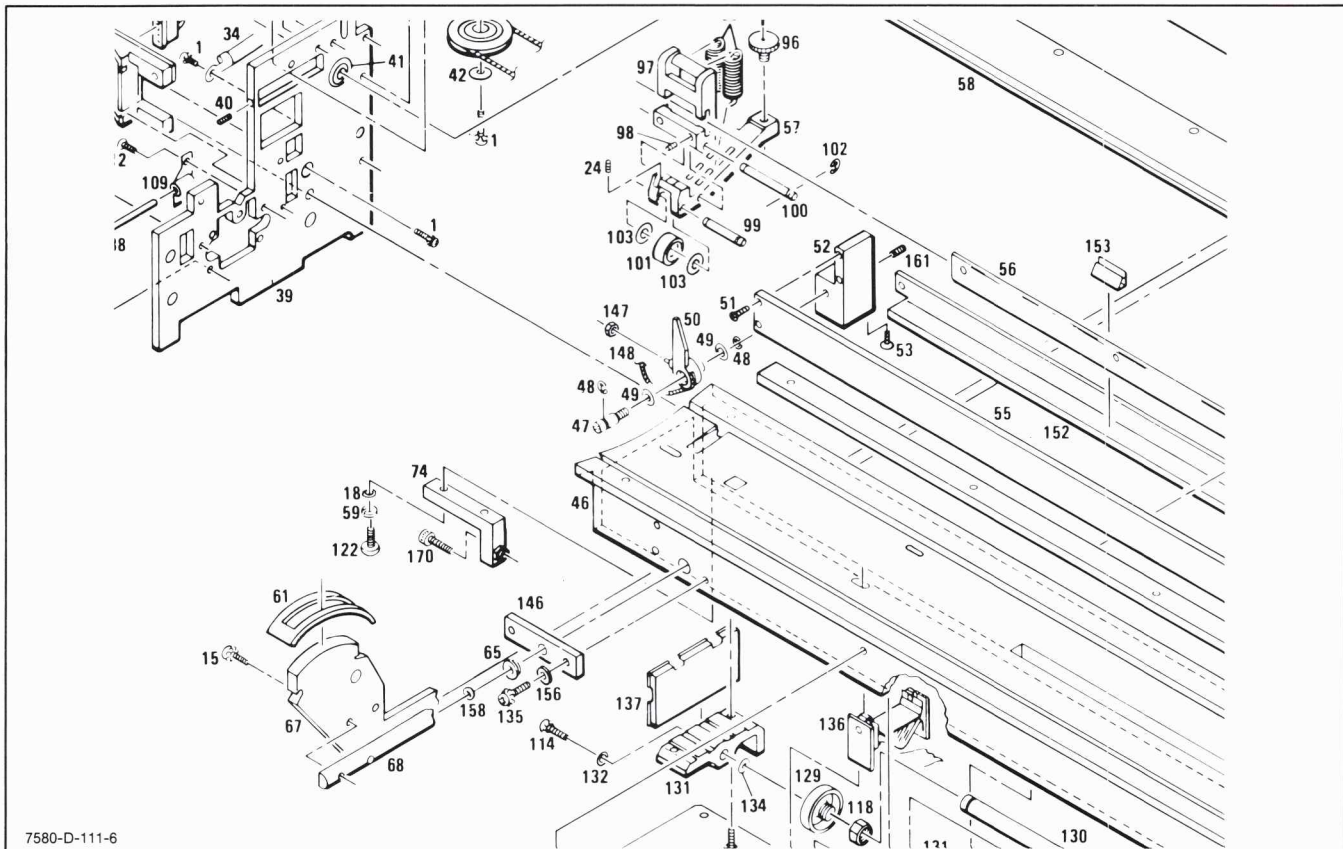
Table 5-3. PCA Date Codes

PCA	DATE CODE	ITEM(S)
REAR PANEL PCA A1 07585-60263 07585-60275	2302 2633 2402 2633	6, 7 7 7, 8 7
EXTERNAL I/O PCA A2 07585-60262	2302 2303	9 9
PROCESSOR PCA A3 07585-60268 07585-60269 07585-60369	2302 2303 2331 2402 2415-2426 2444 2543	10, 11, 12, 13, 14, 15 10, 11, 12, 13, 14, 15 11, 12, 13, 14, 15 12, 13, 14, 15 13, 14, 15 14, 15 15
INTERNAL I/O PCA A5 07585-60261	2302 2334 2619	16, 17, 18 17, 18 18
SERVO PCA A6 07580-60107	2302 2324 2334 2506 2511	19, 20, 21, 22 20, 21, 22 21, 22 21, 22 22
TRANSISTOR PCA A9 07580-60103	2101	23

ITEM 1

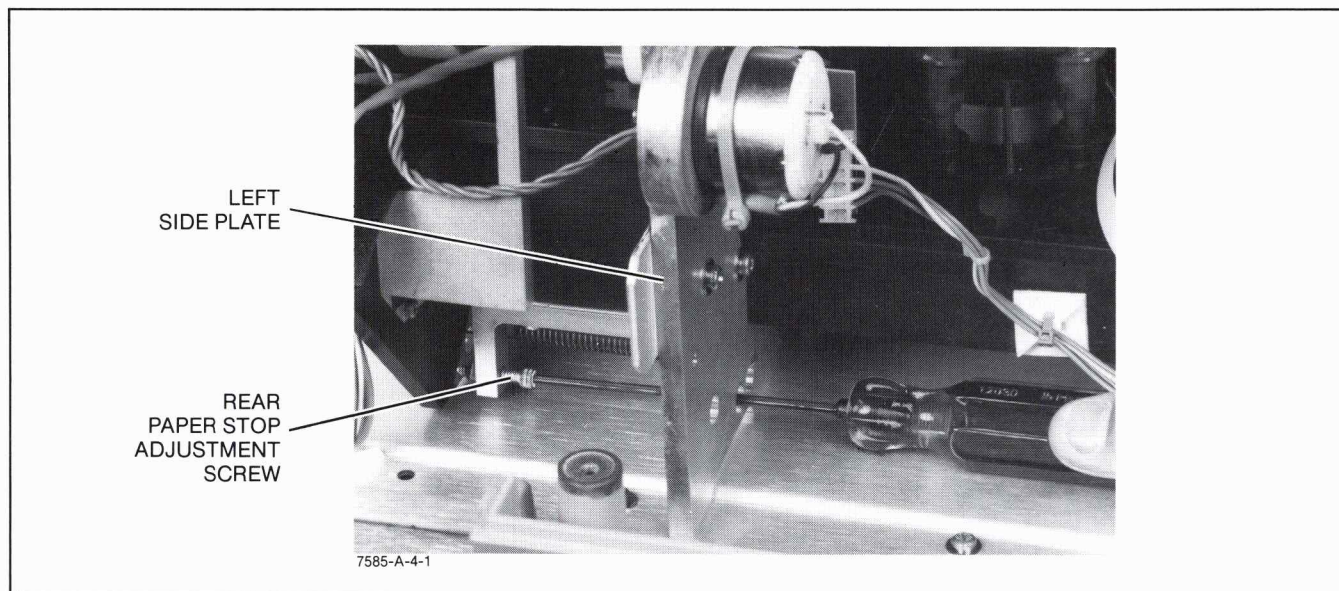
Except for the following differences, the Pen, Media, and Motor Drive Mechanics Assembly is the same assembly documented in Section IV of this manual.

<u>REFERENCE DESIGNATOR</u>	<u>PART NUMBER</u>	<u>DESCRIPTION</u>	<u>CHECK DIGIT</u>
74	07585-20312	MOUNT-ADJUSTMENT	5
99	07580-20140	AXLE-PINCH ROLLER	2
101	07580-60019	PINCH WHEEL SUB-ASSEMBLY	8
103	3050-1059	WASHER-FLAT (STOP)	1



Partial View of Pen, Media, and Motor Drive Mechanics Assembly
Illustrated Parts Breakdown

The adjustment mount is shown in the following figure.



Adjustment-Mount

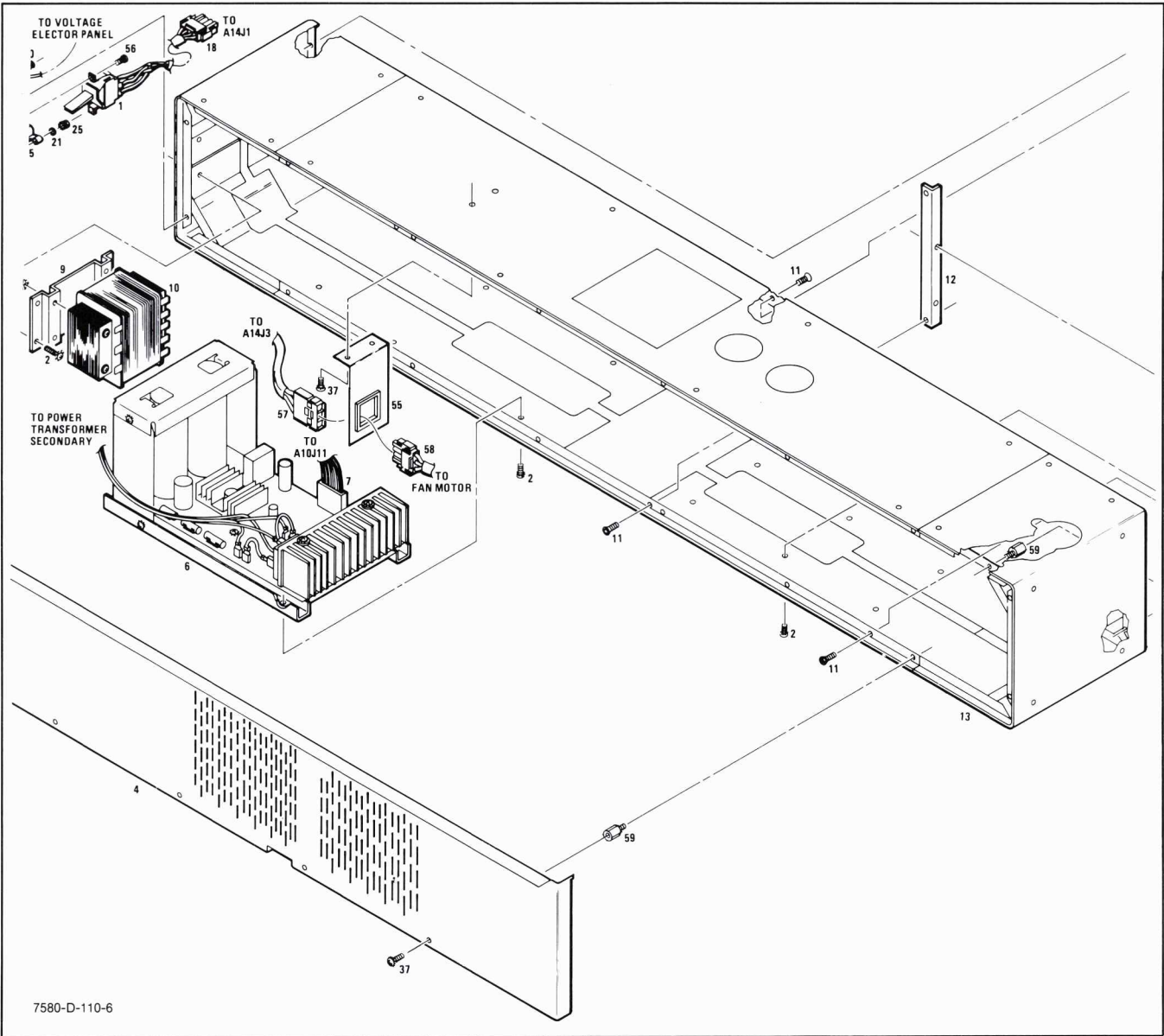
ITEM 2

Except for the following part number, the Front-Panel and Pen Carousel Cover Assemblies are the same as the assemblies documented in Section IV of this manual.

<u>REFERENCE DESIGNATOR</u>	<u>PART NUMBER</u>	<u>DESCRIPTION</u>	<u>CHECK DIGIT</u>
7	07580-40110	MOUNTING CUP	8

Except for the following differences, the Parts List, Electronics Enclosure Assembly is the same as the assembly documented in Section IV of this manual.

<u>REFERENCE DESIGNATOR</u>	<u>PART NUMBER</u>	<u>DESCRIPTION</u>	<u>CHECK DIGIT</u>
12	07580-00048	SUPPORT-FRONT CHASSIS (LH)	7
13	07580-60076	ELECTRONIC CASE ASSEMBLY	2
16	07580-00045	SUPPORT BRACKET-CASE	4
26	07580-20214	STANDOFF	1
33	07580-00046	SUPPORT-INNER PCA	5
39	07580-00047	SUPPORT-FRONT CHASSIS (RH)	6
47	1251-1198	STANDOFF	3
55	07580-00312	BRACKET-FAN CABLE	8
59	07580-20215	STANDOFF	2



Partial View of Electronic Enclosure Assembly
Illustrated Parts Breakdown

Except for the following part numbers, the Stand Assembly is the same assembly documented in Section IV of this manual.

REFERENCE DESIGNATOR	PART NUMBER	DESCRIPTION	CHECK DIGIT
7	07580-00030	TABLE-FRONT	7
11	07580-00031	TABLE-REAR	8
18	07585-60076	ELECTRONIC CASE ASSEMBLY	2
19	2680-0103	SCREW 10-32 0.5-IN-LG PAN-HD POZI	8

ITEM 3

Except for the following part number, the Front-Panel and Pen Carousel Cover Assemblies are the same as the assemblies documented in Section IV of this manual.

<u>REFERENCE DESIGNATOR</u>	<u>PART NUMBER</u>	<u>DESCRIPTION</u>	<u>CHECK DIGIT</u>
31	07580-60122	PANEL-FRONT (RH)	4

Except for the following part numbers, the Electronics Enclosure Assembly is the same as the assembly documented in Section IV of this manual.

<u>REFERENCE DESIGNATOR</u>	<u>PART NUMBER</u>	<u>DESCRIPTION</u>	<u>CHECK DIGIT</u>
29	1251-4470	CONNECTOR-AC POWER	0
39	07580-00198	SUPPORT-FRONT CHASSIS	8

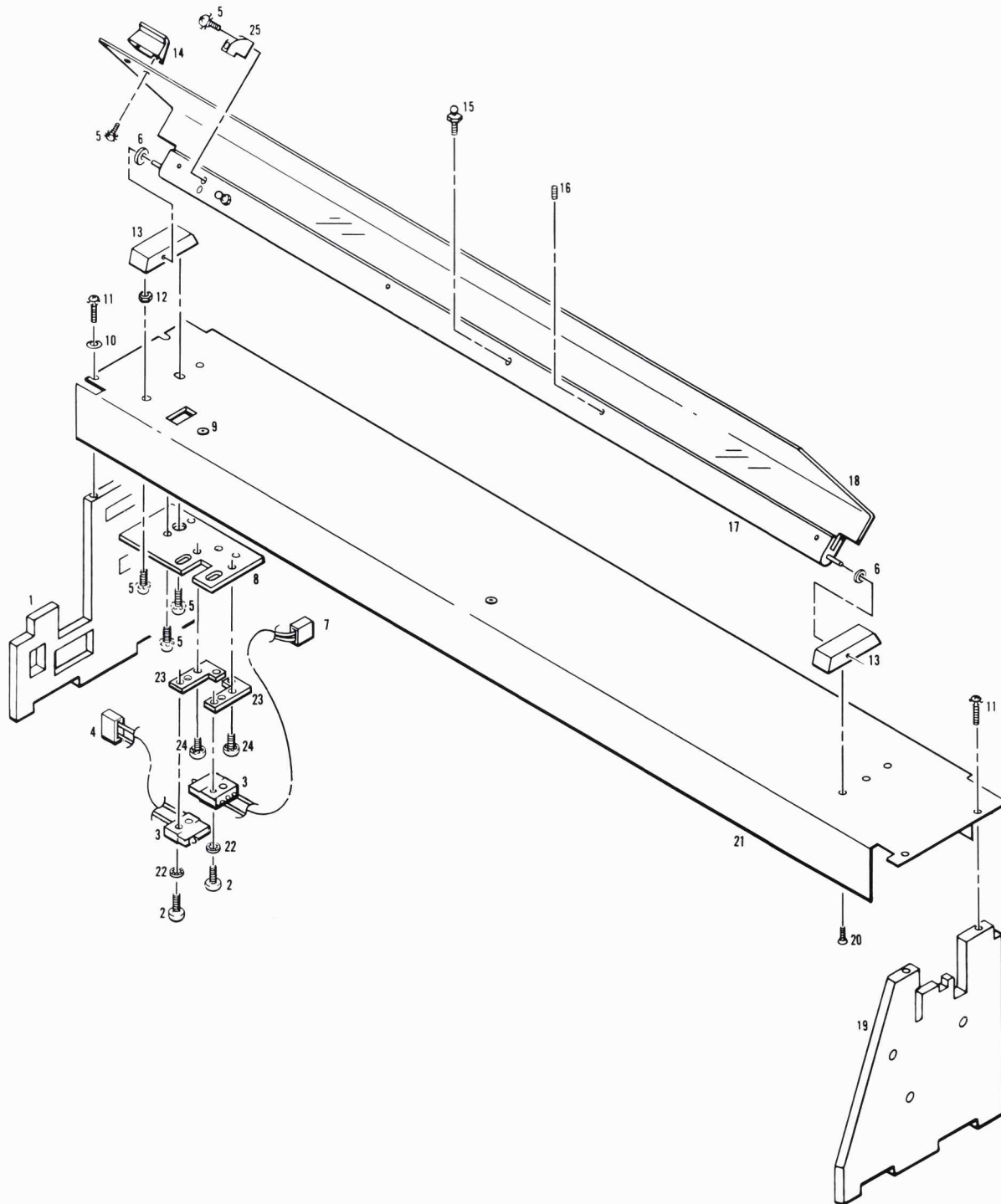
Except for the following part numbers, the Pen, Media, and Motor Drive Mechanics assembly is the same as the assembly documented in Section IV of this manual.

<u>REFERENCE DESIGNATOR</u>	<u>PART NUMBER</u>	<u>DESCRIPTION</u>	<u>CHECK DIGIT</u>
22	07580-60077	STABLE ADAPTER ASSEMBLY	8
23	3030-0161	SCREW-SET	2
98	3030-0007	SCREW-SET	5
104	9160-0283	MAGNET-SENSOR (REED SWITCH)	0
105	07585-40107	LIFT ARM-PINCH ROLLER (RH)	8
110	07580-60016	MOTOR-ENCODER ASSY.	5

ITEM 4

Except for the following part numbers, the Carriage and Y-arm Cover assembly is the same as the assembly documented in Section IV of this manual.

<u>REFERENCE DESIGNATOR</u>	<u>PART NUMBER</u>	<u>DESCRIPTION</u>	<u>CHECK DIGIT</u>
6	3050-0700	WASHER (RH)	7
9	4040-1846	GROMMET	4
13	07585-60244	BLOCK-GUARD	6
14	07580-20164	HANDLE-FINGER GUARD	0
15	07580-60122	PIN-GROMMET	0
16	3030-0022	SCREW	4
17	07585-60288	FINGER GUARD	8
18	07580-20187	COVER-CARRIAGE	7
21	07580-00171	COVER, Y-ARM	7
25	07585-40102	ACTUATOR-MICROSWITCH	3



7580-B-113-3

Carriage and Y-Arm Cover Assemblies

ITEM 5

Except for the following part number and figure, the Pen, Media, and Motor Drive Mechanics assembly is the same as the assembly documented in Section IV of this manual.

REFERENCE DESIGNATOR	PART NUMBER	DESCRIPTION	CHECK DIGIT
91	07585-20165	BUSHING-PIVOT	1

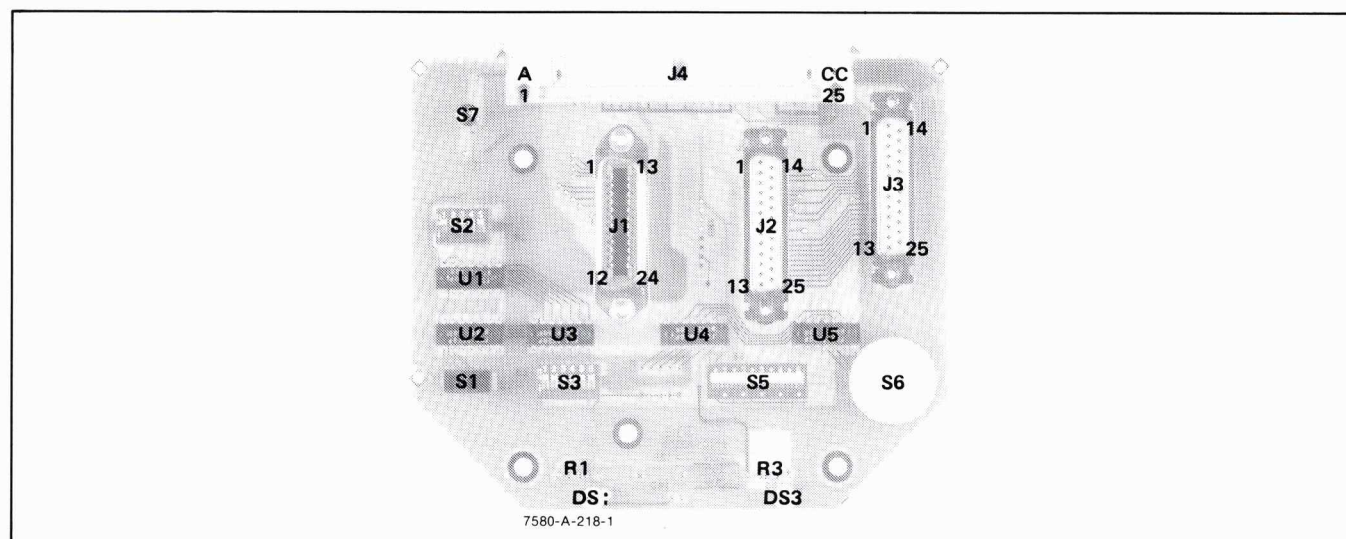
Pen, Media, and Motor Drive Mechanics Assembly
Partial Illustrated Parts Breakdown

ITEM 6

PCAs with date codes that have Item 6 in the ITEM(S) column of Table 5-3 have a different parts list, component layout, and schematic diagram from those documented in the manual. Use the following parts list, identification diagram, and the schematic diagram in Figure A-7A at the end of this section.

Parts List, HP-IB/RS-232-C (Dual I/O) Rear Panel PCA A1

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A1	07585-60263	9	1	PCA, REAR PANEL	28480	07585-60263
A1DS1	1990-0487	7	2	LED-LAMP LUM-INT=1MCD IF=20MA-MAX BVR=5V	28480	5082-4584
A1DS3	1990-0487	7	2	LED-LAMP LUM-INT=1MCD IF=20MA-MAX BVR=5V	28480	5082-4584
A1J1	1251-4040	0	1	CONNECTOR 24-PIN F MICRO RIBBON	28480	1251-4040
A1J2	1251-4946	5	2	CONNECTOR 25-PIN F D SUBMIN	28480	1251-4946
A1J3	1251-4946	5	1	CONNECTOR 25-PIN F D SUBMIN	28480	1251-4946
A1J4	1251-6067	5	1	CONNECTOR 60-PIN M POST TYPE	28480	1251-6067
A1R1	0698-3443	0	2	RESISTOR 287 1% .125W F TC=0+-100	24546	C4-1/8-T0-287R-F
A1R3	0698-3443	0	2	RESISTOR 287 1% .125W F TC=0+-100	24546	C4-1/8-T0-287R-F
A1S1	3101-2199	1	1	SWITCH-SL SPDT MINTR 6A 125VAC PC	28480	3101-2199
A1S2	3101-2630	5	1	SWITCH-SLIDE 5 SPST	28480	3101-2630
A1S3	3101-2629	2	1	SWITCH-SLIDE 6 SPST	28480	3101-2629
A1S5	3101-2627	0	1	SWITCH-SLIDE 5 SPDT	28480	3101-2627
A1S6	3100-1690	3	1	SWITCH-ROTARY 16 POS BCO	28480	3100-1690
A1S7	3101-0451	4	1	SWITCH-PB SPST-NO MOM .5A 115VAC BLK-RTN	28480	3101-0451
A1U1	1906-0248	1	5	DIODE-ARRAY 40V 400MA	28480	1906-0248
A1U2	1906-0248	1		DIODE-ARRAY 40V 400MA	28480	1906-0248
A1U3	1906-0248	1		DIODE-ARRAY 40V 400MA	28480	1906-0248
A1U4	1906-0248	1		DIODE-ARRAY 40V 400MA	28480	1906-0248
A1U5	1906-0248	1		DIODE-ARRAY 40V 400MA	28480	1906-0248
				MISCELLANEOUS		
	03968-20106	0	2	SPACER-HP-IB CONNECTOR	28480	03968-20106
	07221-20001	0	4	STANDOFF	28480	07221-20001
	07580-40060	7	2	SPACER-LED	28480	07580-40060



Rear Panel PCA A1 Component Identification Diagram

ITEM 7

Except for the following parts, the Rear Panel PCA is the same as the assembly documented in Section IV of this manual.

<u>REFERENCE DESIGNATOR</u>	<u>PART NUMBER</u>	<u>DESCRIPTION</u>	<u>CHECK DIGIT</u>
S1	3101-2199	SWITCH-SLIDE	1

ITEM 8

Except for the following parts, the Rear Panel PCA is the same as the assembly documented in Section IV of this manual.

<u>REFERENCE DESIGNATOR</u>	<u>PART NUMBER</u>	<u>DESCRIPTION</u>	<u>CHECK DIGIT</u>
J1	1251-4040	CONNECTOR	0
	5020-6316	STANDOFF	2

ITEM 9

PCAs with date codes that have Item 9 in the ITEM(S) column of Table 5-3 have a different parts list, component layout, and schematic diagram from those documented in this manual. Refer to the following table for the parts lists.

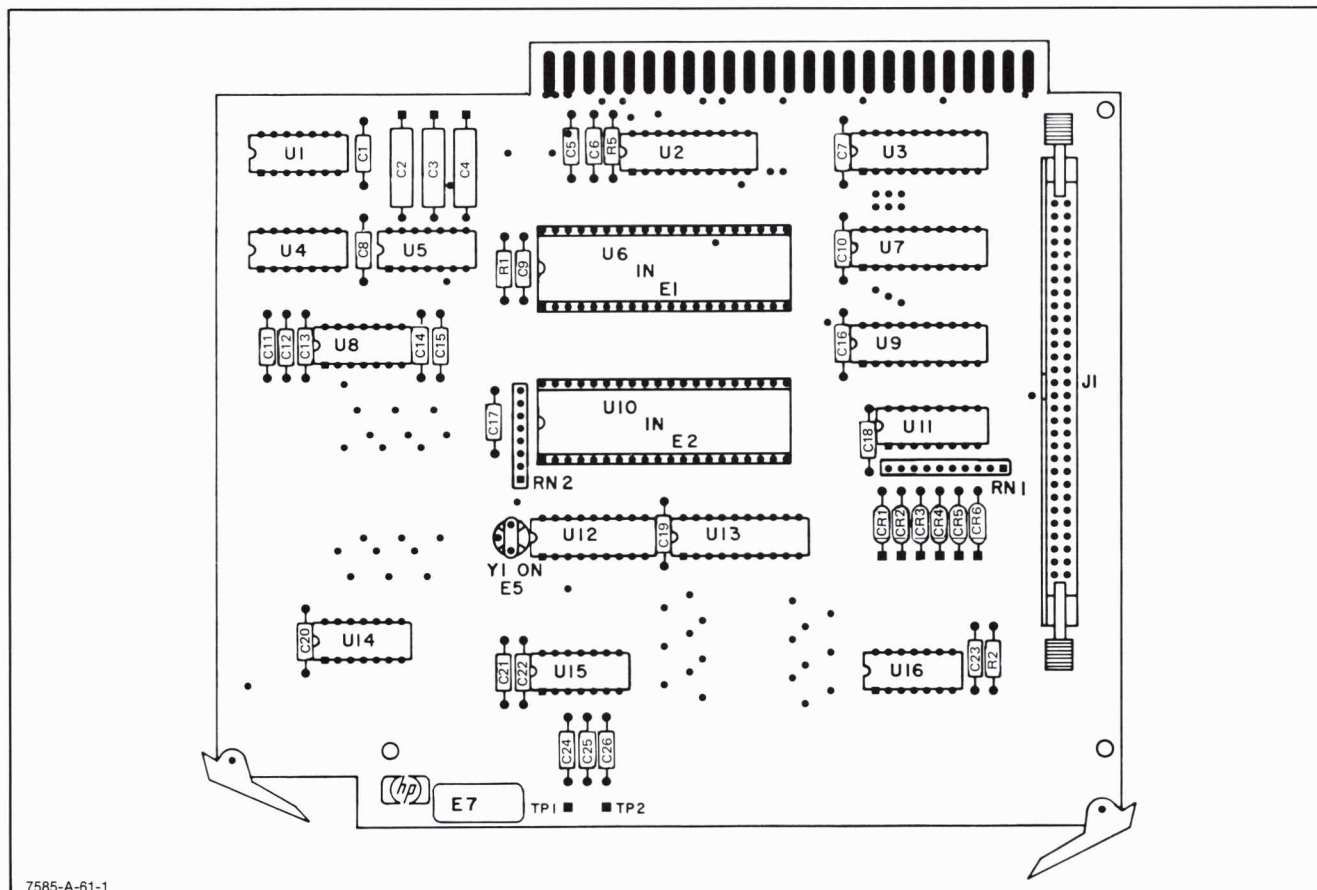
Parts List, HP-IB/RS-232-C (Dual I/O) Interface PCA A2

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A2	07585-60262	0	1	PCA, INTERFACE	28480	07585-60262
A2C1	0160-3847	9	17	CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
A2C2	0180-0100	3	2	CAPACITOR-FXD 4.7UF+-10% 35VDC TA	56289	150D475X9035B2
A2C3	0180-0228	6	1	CAPACITOR-FXD 22UF+-10% 15VDC TA	56289	150D226X9015B2
A2C4	0180-0100	3		CAPACITOR-FXD 4.7UF+-10% 35VDC TA	56289	150D475X9035B2
A2C5	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
A2C6	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
A2C7	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
A2C8	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
A2C9	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
A2C10	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
A2C11	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
A2C12	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
A2C13	0160-4574	1	6	CAPACITOR-FXD 1000PF +-10% 100VDC CER	28480	0160-4574
A2C14	0160-4574	1		CAPACITOR-FXD 1000PF +-10% 100VDC CER	28480	0160-4574
A2C15	0160-4574	1		CAPACITOR-FXD 1000PF +-10% 100VDC CER	28480	0160-4574
A2C16	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
A2C17	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
A2C18	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
A2C19	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
A2C20	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
A2C21	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
A2C22	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
A2C23	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
A2C24	0160-4574	1		CAPACITOR-FXD 1000PF +-10% 100VDC CER	28480	0160-4574
A2C25	0160-4574	1		CAPACITOR-FXD 1000PF +-10% 100VDC CER	28480	0160-4574
A2C26	0160-4574	1		CAPACITOR-FXD 1000PF +-10% 100VDC CER	28480	0160-4574
A2CR1-A2CR8	1901-0040	1	8	DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A2J1	1251-6846	8	1	CONNECTOR 60-PIN M POST TYPE	28480	1251-6846
A2K1	0490-1128	4	2	RELAY 6C 12VDC-COIL 1A 120VAC	28480	0490-1128
A2K2	0490-1128	4		RELAY 6C 12VDC-COIL 1A 120VAC	28480	0490-1128
A2Q1	1854-0547	2	2	TRANSISTOR NPN 2N3725 SI TO-5 PD=800MW	01295	2N3725
A2Q2	1854-0547	2		TRANSISTOR NPN 2N3725 SI TO-5 PD=800MW	01295	2N3725
A2R1	0683-2225	3	2	RESISTOR 2.2K 5% .25W FC TC=-400/+700	01121	CB2225
A2R2	0683-2225	3		RESISTOR 2.2K 5% .25W FC TC=-400/+700	01121	CB2225
A2R3	0698-0082	7	2	RESISTOR 464 1% .125W F TC=0+-100	24546	C4-1/8-T0-4640-F
A2R4	0698-0082	7		RESISTOR 464 1% .125W F TC=0+-100	24546	C4-1/8-T0-4640-F
A2R5	0698-3444	1	1	RESISTOR 316 1% .125W F TC=0+-100	24546	C4-1/8-T0-316R-F

Parts List, HP-IB/RS-232-C (Dual I/O) Interface PCA A2 (Continued)

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A2RN1	1010-0277	3	1	NETWORK-RES 10-SIP2.2K OHM X 9	01121	210A222
A2RN2	1010-0231	9	1	NETWORK-RES 8-SIP2.2K OHM X 7	01121	208A222
A2TP1	1251-4637	1	2	CONNECTOR-SGL CONT PIN .031-IN-BSC-SZ	20480	1251-4637
A2TP2	1251-4637	1		CONNECTOR-SGL CONT PIN .031-IN-BSC-SZ	20480	1251-4637
A2U1	1020-1416	5	1	IC SCHMITT-TRIG TTL LS INV HEX 1-INP	01295	SN74LS14N
A2U2	1020-2024	3	1	IC DRV R TTL LS LINE DRV R DCTL	01295	SN74LS244N
A2U3	1020-2075	4	1	IC MISC TTL LS	01295	SN74LS245N
A2U4	1020-1202	7	1	IC GATE TTL LS NAND TPL 3-INP	01295	SN74LS10N
A2U5	1020-1197	9	1	IC GATE TTL LS NAND QUAD 2-INP	01295	SN74LS00N
A2U6	1020-2548	6	1	IC TMS9914 (GPB ADAPTOR)	20480	1020-2548
A2U7	1020-2405	0	1	IC RCVR TTL LS BUS DCTL	01295	SN75160N
A2U8	1020-0509	5	2	IC DRV R DTL LINE DRV R QUAD	04713	MC1488L
A2U9	1020-2403	8	1	IC RCVR TTL LS BUS DCTL	01295	SN75161N
A2U10	1020-2072	9	1	IC Z8470 (DART)	20480	1020-2072
A2U11	1020-2945	7	1	IC CD4502B (BUS INTERFACE)	20480	1020-2945
A2U12	1020-3134	8	1	IC RP GEN	20480	1020-3134
A2U13	1020-1997	7	1	IC FF TTL LS D-TYPE POS-EDGE-TRIG PRL-TN	01295	SN74LS374N
A2U14	1020-0990	8	2	IC RCVR DTL NAND LINE QUAD	01295	SN75189AJ
A2U15	1020-0509	5		IC DRV R DTL LINE DRV R QUAD	04713	MC1488L
A2U16	1020-0990	8		IC RCVR DTL NAND LINE QUAD	01295	SN75189AJ
A2Y1	0410-0733	7	1	CRYSTAL-QUARTZ 5.0688 MHZ HC-10/U-HLDR	20480	0410-0733
				MISCELLANEOUS		
	0340-0164	9	1	INSUL Z51R	20480	0340-0164
	0510-0843	2	2	PIN-SPL .062-IN-DIA .25-IN-LG SST	20480	0510-0843
	1200-0654	7	2	SOCKET-IC 40-CONT DIP DIP-SLDR	20480	1200-0654
	4040-0753	0	2	EXTR-PC BD GRN POLYC .062 BD-THKNS	20480	4040-0753

See the figure below for the component layout, and see Figure A-7A at the end of this section for the schematic diagram that reflects this date code.



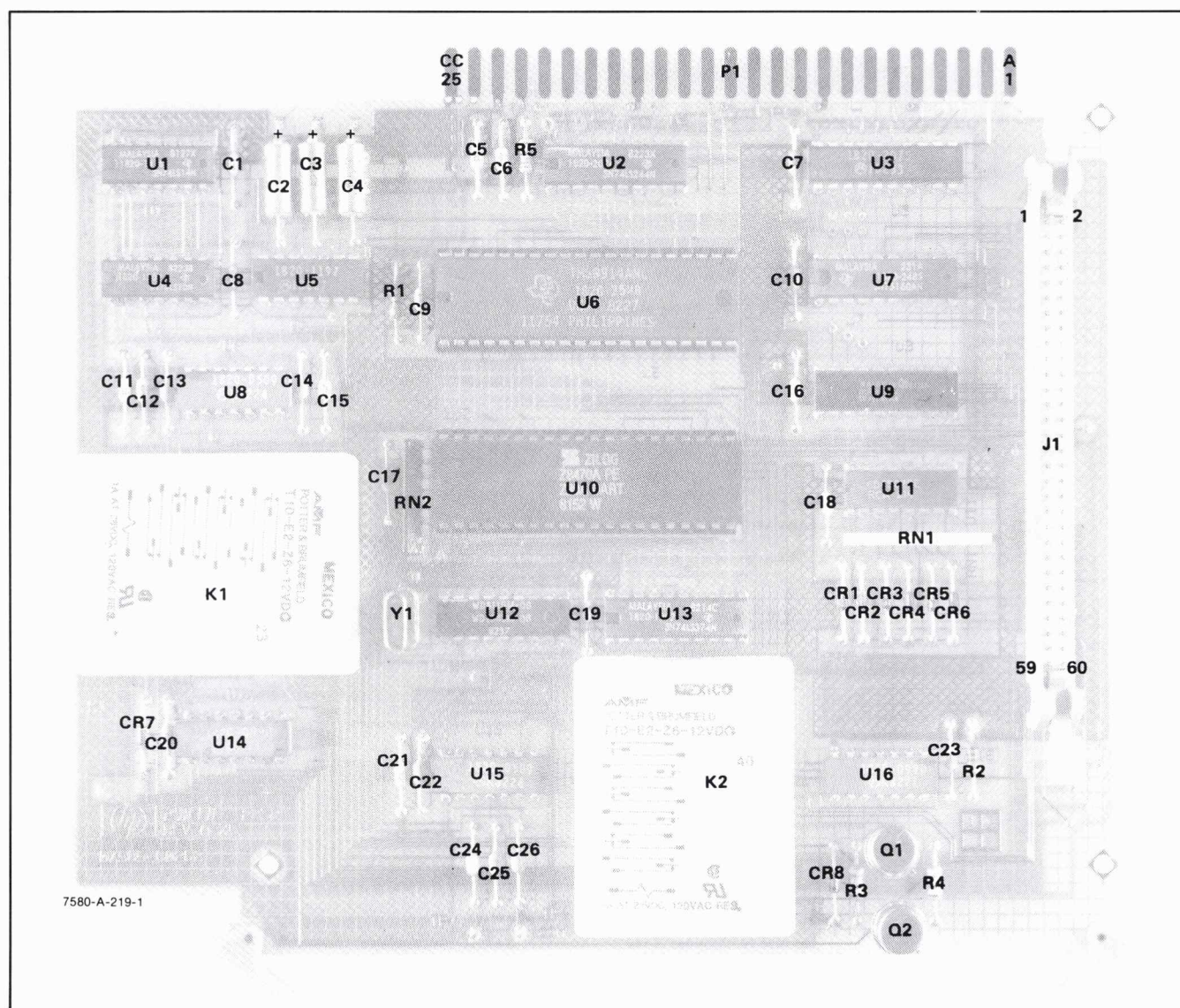
Interface PCA A2 Component Identification Diagram

If Self-Test 20 in Section II is to be performed on a plotter containing a PCA with this date code, ignore the first step under "Operator Action" which reads "Connect the male-to-male RS-232-C cable to the modem and terminal connectors on the back panel." All other tests and procedures remain the same.

Some PCAs with this date code may have the following relays and additional components installed.

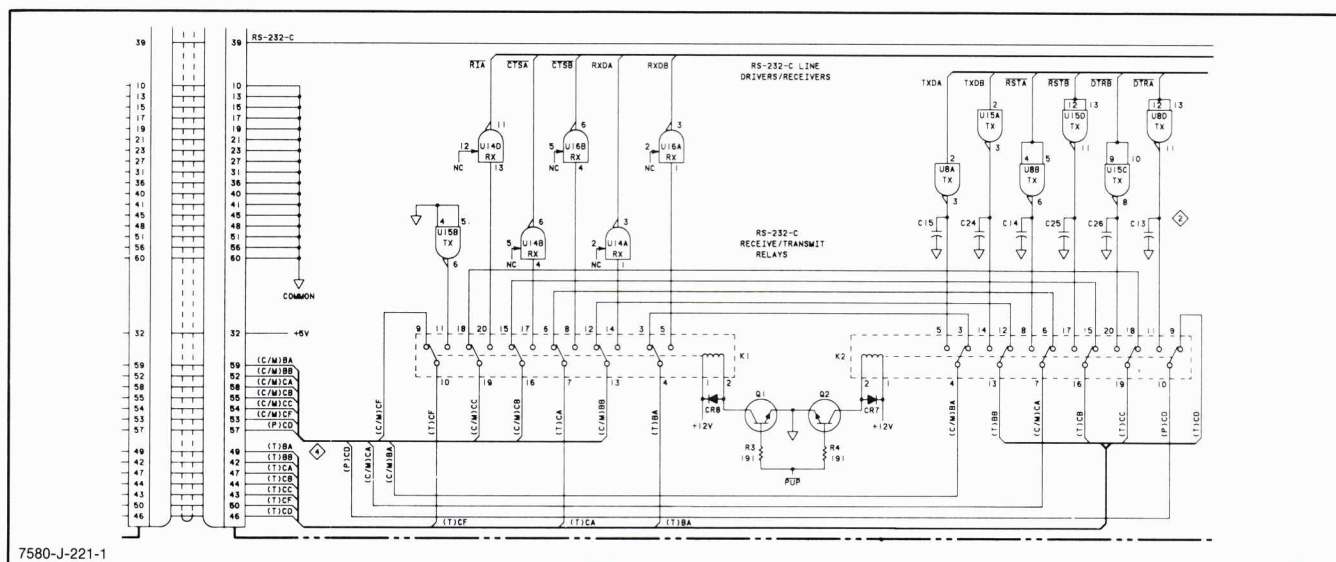
REFERENCE DESIGNATOR	PART NUMBER	DESCRIPTION	CHECK DIGIT
A2K1	0490-1128	RELAY 6C 12VDC-COIL 1A 120VAC	4
A2K2	0490-1128	RELAY 6C 12VDC-COIL 1A 120VAC	4
A2Q1	1854-0547	TRANSISTOR NPN 2N3725	2
A2Q2	1854-0547	TRANSISTOR NPN 2N3725	2
A2R3	0698-0082	RESISTOR 464 1% .125W	7
A2R4	0698-0082	RESISTOR 464 1% .125W	7
A2CR7, CR8	1901-0040	DIODE-SWITCHING 30V 50mA	1

The component layout for these PCAs is illustrated in the following figure.



Interface PCA A2 Component Identification Diagram

Except for the following portion, the PCA schematic diagram is the same as the schematic shown in Figure A-7A at the end of this section.



Dual I/O Interface PCA (A2) Partial Schematic Diagram

ITEM 10

PCAs with date codes that have Item 10 in the ITEM(S) column of Table 5-3 are the same as the PCAs described in Item 11 except for the following two Eprom part numbers.

REFERENCE DESIGNATOR	PART NUMBER	DESCRIPTION	CHECK DIGIT
U7	07585-18004	EPROM-2 LSB	7
U8	07585-18003	EPROM-2 MSB	6

See Service Sheet 4A at the end of this section for the component layout and schematic diagram that reflects this date code.

ITEM 11

PCAs with date codes that have Item 11 in the ITEM(S) column of Table 5-3 have a different parts list, component layout, and schematic diagram from those documented in the manual. Refer to the following table for the parts lists and see Service Sheet 4A at the end of this section for the component layout and the schematic diagram that reflects this date code.

Parts List, Processor PCA (A3)

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A3	07585-60268	4	1	PROCESSOR, PCA	28480	07585-60268
A3C1	0160-2198	1	2	CAPACITOR-FXD 20PF +-5% 300VDC MICA	28480	0160-2198
A3C2	0160-2150	5	1	CAPACITOR-FXD 33PF +-5% 300VDC MICA	28480	0160-2150
A3C3	0160-3847	9	19	CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
A3C4	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
A3C5	0180-1746	5	1	CAPACITOR-FXD 15UF+-10% 20VDC TA	56289	150D156X9020B2
A3C6	0160-2198	1		CAPACITOR-FXD 20PF +-5% 300VDC MICA	28480	0160-2198
A3C7	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
A3C8	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
A3C9	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
A3C10	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
A3C11	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
A3C12	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
A3C13	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
A3C14	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
A3C15	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
A3C16	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
A3C17	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
A3C18	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
A3C19	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
A3C20	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
A3C21	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
A3C22	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
A3C23	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
A3DS1-4	1990-0654	0	2	LED-LAMP LUM-INT=500UCD IF=50MA-MAX	28480	HLMP-6204
A3DS5-8	1990-0654	0		LED-LAMP LUM-INT=500UCD IF=50MA-MAX	28480	HLMP-6204
A3Q1	1853-0015	7	1	TRANSISTOR PNP SI PD=200MW FT=500MHZ	28480	1853-0015
A3R1	0757-0274	5	1	RESISTOR 1.21K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1211-F
A3R2	0757-0416	7	1	RESISTOR 511 1% .125W F TC=0+-100	24546	C4-1/8-T0-511R-F
A3R3	0698-3430	5	1	RESISTOR 21.5 1% .125W F TC=0+-100	03888	PME55-1/8-T0-21R5-F
A3R4	0698-0084	9	1	RESISTOR 2.15K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2151-F
A3RN1	1810-0279	5	4	NETWORK-RES 10-SIP4.7K OHM X 9	01121	210A472
A3RN2	1810-0279	5		NETWORK-RES 10-SIP4.7K OHM X 9	01121	210A472
A3RN3	1810-0279	5		NETWORK-RES 10-SIP4.7K OHM X 9	01121	210A472
A3RN4	1810-0272	8	1	NETWORK-RES 10-SIP330.0 OHM X 9	01121	210A331
A3RN5	1810-0279	5		NETWORK-RES 10-SIP4.7K OHM X 9	01121	210A472
A3S1	3101-2094	5	1	SWITCH-RKR DIP-RKR-ASSY 8-1A .05A 30VDC	28480	3101-2094
A3S2	3101-2288	9	1	SWITCH-PB SPDT MOM .25A 115VAC RED-BTN	28480	3101-2288
A3TP1	1251-4637	1		CONNECTOR-SGL CONT PIN .031-IN-BSC-SZ	28480	1251-4637
A3TP2	1251-4637	1		CONNECTOR-SGL CONT PIN .031-IN-BSC-SZ	28480	1251-4637
A3U1	1818-0443	1	8	IC NMOS 4096 (4K) STAT RAM 300-NS 3-S	50545	UPD2114LC-1
A3U2	07585-18002	5	1	IC NMOS 32768 (32K) EPROM 450-NS 3-S	01295	TM52532JL
A3U3	07585-18001	4	1	IC NMOS 32768 (32K) EPROM 450-NS 3-S	01295	TM52532JL
A3U4	1813-0150	7	1	IC OSC CMOS	32293	ICM7209IPA
A3U5	1818-0443	1		IC NMOS 4096 (4K) STAT RAM 300-NS 3-S	50545	UPD2114LC-1
A3U6	1818-0443	1		IC NMOS 4096 (4K) STAT RAM 300-NS 3-S	50545	UPD2114LC-1
A3U7	07585-18014	4	1	IC NMOS 32768 (32K) EPROM 450-NS 3-S	01295	TM52532JL
A3U8	07585-18013	8	1	IC NMOS 32768 (32K) EPROM 450-NS 3-S	01295	TM52532JL
A3U9	1820-1112	8	2	IC FF TTL LS D-TYPE POS-EDGE-TRIG	01295	SN74LS74AN
A3U10	1820-1199	1	1	IC INV TTL LS HEX 1-INP	01295	SN74LS04N
A3U11	1820-1197	9	2	IC GATE TTL LS NAND QUAD 2-INP	01295	SN74LS00N
A3U12	1820-1416	5	1	IC SCHMITT-TRIG TTL LS INV HEX 1-INP	01295	SN74LS14N
A3U13	1820-1918	2	1	IC BFR TTL LS LINE DRVR OCTL	01295	SN74LS241N
A3U14	1820-2075	4	4	IC MISC TTL LS	01295	SN74LS245N
A3U15	1820-2075	4		IC MISC TTL LS	01295	SN74LS245N
A3U16	1818-0443	1		IC NMOS 4096 (4K) STAT RAM 300-NS 3-S	50545	UPD2114LC-1
A3U17	07585-18006	9	1	IC NMOS 32768 (32K) EPROM 450-NS 3-S	01295	TM52532JL
A3U18	07585-18005	8	1	IC NMOS 32768 (32K) EPROM 450-NS 3-S	01295	TM52532JL
A3U19	1820-1212	9	1	IC FF TTL LS J-K NEG-EDGE-TRIG	01295	SN74LS112AN
A3U20	1820-1195	7	1	IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	SN74LS175N
A3U21	1820-2024	3	2	IC DRVR TTL LS LINE DRVR OCTL	01295	SN74LS244N
A3U22	1820-1197	9		IC GATE TTL LS NAND QUAD 2-INP	01295	SN74LS00N
A3U23	1820-2075	4		IC MISC TTL LS	01295	SN74LS245N
A3U24	1820-2075	4		IC MISC TTL LS	01295	SN74LS245N
A3U25	1818-0443	1		IC NMOS 4096 (4K) STAT RAM 300-NS 3-S	50545	UPD2114LC-1

Parts List, Processor PCA (A3) (Continued)

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A3U26	1818-0443	1		IC NMOS 4096 (4K) STAT RAM 300-NS 3-S	S0545	UPD2114LC-1
A3U27	07585-18008	1	1	IC NMOS 32768 (32K) EPROM 450-NS 3-S	28480	07585-18008
A3U28	07585-18007	0	1	IC NMOS 32768 (32K) EPROM 450-NS 3-S	28480	07585-18007
A3U29	1818-0443	1		IC NMOS 4096 (4K) STAT RAM 300-NS 3-S	S0545	UPD2114LC-1
A3U30	07585-18010	5	1	IC NMOS 32768 (32K) EPROM 450-NS 3-S	28480	07585-18010
A3U31	07585-18009	2	1	IC NMOS 32768 (32K) EPROM 450-NS 3-S	28480	07585-18009
A3U32	1820-1216	3	3	IC DCDR TTL LS 3-TO-8-LINE 3-INP	01295	SN74LS138N
A3U33	1820-1208	3	2	IC GATE TTL LS OR QUAD 2 INP	01295	SN74LS32N
A3U34	1820-1216	3		IC DCDR TTL LS 3-TO-8-LINE 3-INP	01295	SN74LS138N
A3U35	1820-1198	0	1	IC GATE TTL LS NAND QUAD 2 INP	01295	SN74LS03N
A3U36	1820-1208	3		IC GATE TTL LS OR QUAD 2-INP	01295	SN74LS32N
A3U37	1820-2102	8	2	IC LCH TTL LS D-TYPE OCTL	01295	SN74LS373N
A3U38	1820-2102	8		IC LCH TTL LS D-TYPE OCTL	01295	SN74LS373N
A3U39	1818-0443	1		IC NMOS 4096 (4K) STAT RAM 300-NS 3-S	S0545	UPD2114LC-1
A3U40	1820-1281	2	1	IC DCDR TTL LS 2-TO-4-LINE DUAL 2-INP	01295	SN74LS139N
A3U41	07585-18012	7	1	IC NMOS 32768 (32K) EPROM 450-NS 3-S	28480	07585-18012
A3U42	07585-18011	6	1	IC NMOS 32768 (32K) EPROM 450-NS 3-S	28480	07585-18011
A3U43	1820-1730	6	1	IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	SN74LS273N
A3U44	1820-1112	8		IC FF TTL LS D-TYPE POS-EDGE-TRIG	01295	SN74LS74AN
A3U45	1820-1201	6	2	IC GATE TTL LS AND QUAD 2-INP	01295	SN74LS08N
A3U46	1820-1216	3		IC DCDR TTL LS 3-TO-8-LINE 3-INP	01295	SN74LS138N
A3U47	1820-2553	3	1	IC-CPU Z8002	28480	1820-2553
A3U48	1820-1470	1	1	IC MUXR/DATA-SEL TTL LS 2-TO-1-LINE QUAD	01295	SN74LS157N
A3U49	1820-2024	3		IC DRVR TTL LS LINE DRVR OCTL	01295	SN74LS244N
A3U50	1820-1201	6		IC GATE TTL LS AND QUAD 2-INP	01295	SN74LS08N
A3Y1	0410-0173	9	1	CRYSTAL-QUARTZ 8.000 MHZ	28480	0410-0173
MISCELLANEOUS PARTS						
	0510-0843	2	2	PIN-SPL .062-IN-DIA .25-IN-LG SST	28480	0510-0843
	1200-0541	1	12	SOCKET-IC 24-CONT DIP DIP-SLDR	28480	1200-0541
	1200-0654	7	1	SOCKET-IC 40-CONT DIP DIP-SLDR	28480	1200-0654
	4040-0751	8	2	EXTR-PC BD ORN POLYC .062-BD-THKNS	28480	4040-0751
	1251-4637	1	4	CONNECTOR-SGL CONT PIN .031-IN-BSC-SZ	28480	1251-4637

ITEM 12

Except for the following EPROM part numbers, the Processor PCA is the assembly documented in Section IV of this manual.

REFERENCE DESIGNATOR	PART NUMBER	DESCRIPTION	CHECK DIGIT
U3	07585-18041	EPROM	2
U4	07585-18040	EPROM	1
U19	07585-18043	EPROM	4
U20	07585-18042	EPROM	3
U26	07585-18045	EPROM	6
U27	07585-18044	EPROM	5
U32	07585-18047	EPROM	8
U33	07585-18046	EPROM	7

ITEM 13

Except for the following EPROM part number, the Processor PCA is the same as the assembly documented in Section IV of this manual.

REFERENCE DESIGNATOR	PART NUMBER	DESCRIPTION	CHECK DIGIT
U32	07585-18077	EPROM	4

ITEM 14

Except for the following EPROM part numbers, the Processor PCA is the same as the assembly documented in Section IV of this manual.

<u>REFERENCE DESIGNATOR</u>	<u>PART NUMBER</u>	<u>DESCRIPTION</u>	<u>CHECK DIGIT</u>
U32	07585-18078	EPROM	5
U33	07585-18076	EPROM	3

ITEM 15

Except for the following part, the Processor PCA is the same as the assembly documented in Section IV of this manual.

<u>REFERENCE DESIGNATOR</u>	<u>PART NUMBER</u>	<u>DESCRIPTION</u>	<u>CHECK DIGIT</u>
U36	07585-18050	IC	7

ITEM 16

Except for the following parts, the Internal I/O PCA is the same as the assembly documented in Section IV of this manual.

<u>REFERENCE DESIGNATOR</u>	<u>PART NUMBER</u>	<u>DESCRIPTION</u>	<u>CHECK DIGIT</u>
C41	0160-3847	CAPACITOR-FXD .01UF 50VDC	9
R72	0698-3161	RESISTOR 38.3K 1% .125W	9
R96	0698-3155	RESISTOR 4.64K 1% .125W	1

ITEM 17

Except for the following part, the Internal I/O PCA is the same as the assembly documented in Section IV of this manual.

<u>REFERENCE DESIGNATOR</u>	<u>PART NUMBER</u>	<u>DESCRIPTION</u>	<u>CHECK DIGIT</u>
C37	0160-6685	CAPACITOR-FXD .1UF 50VDC	9

ITEM 18

Except for the following parts, the Internal I/O PCA is the same as the assembly documented in Section IV of this manual.

<u>REFERENCE DESIGNATOR</u>	<u>PART NUMBER</u>	<u>DESCRIPTION</u>	<u>CHECK DIGIT</u>
TP1-19	1251-5177	CONN SGL CONT PIN	6

ITEM 19

Except for the following part, the Servo PCA is the same as the assembly documented in Section IV of this manual.

<u>REFERENCE DESIGNATOR</u>	<u>PART NUMBER</u>	<u>DESCRIPTION</u>	<u>CHECK DIGIT</u>
R53	0757-0278	RESISTOR 1.78K 1% .125W	9

ITEM 20

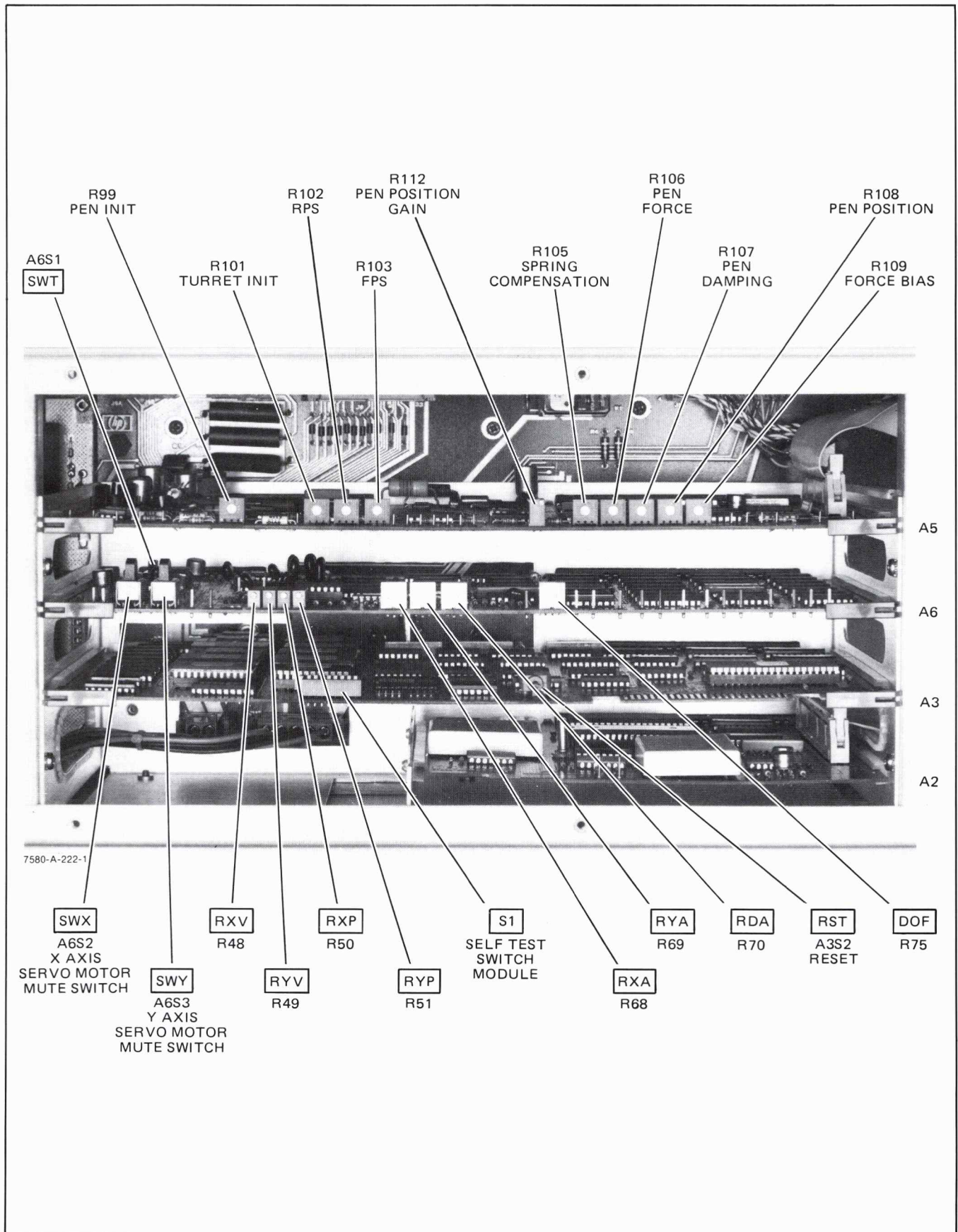
Except for the following parts, parts location and adjustment procedure, the Servo PCA is the same as the assembly documented in Section IV of this manual.

<u>REFERENCE DESIGNATOR</u>	<u>PART NUMBER</u>	<u>DESCRIPTION</u>	<u>CHECK DIGIT</u>
R24	0698-0083	RESISTOR 1.96K 1% .125W	8
R25	0757-0279	RESISTOR 3.16K 1% .125W	0
R26	0757-0279	RESISTOR 3.16K 1% .125W	0
R27	0698-0083	RESISTOR 1.96K 1% .125W	8
R41	0757-0447	RESISTOR 16.2K 1% .125W	4
R48	2100-3109	RESISTOR-TRMR 2K 10% SIDE-ADJ	2
R49	2100-3109	RESISTOR-TRMR 2K 10% SIDE-ADJ	2
R50	2100-3109	RESISTOR-TRMR 2K 10% SIDE-ADJ	2
R52	0757-1094	RESISTOR 1.47K 1% .125W	9
R53	0757-0278	RESISTOR 1.78K 1% .125W	9
R54	0757-0438	RESISTOR 5.11K 1% .125W	3
R60	0698-7332	RESISTOR 1M 1% .125W	4
R61	0698-7332	RESISTOR 1M 1% .125W	4

Except for the following adjustment procedure and figure, the procedures and figures are the same as those documented in Section III of this manual.

Electrical Adjustments — Quick Reference Guide

<u>ADJUSTMENT NAME</u>	<u>LOCATION</u>	<u>ADJUSTMENT REF. DESIG.</u>	<u>READING</u>	<u>PROCEDURE</u>
Position and Velocity Gain Adjustments	X- and Y-Axis Servo PCA (A6)	A6R50	5.64 kilohms (± 0.01 kilohms)	Connect multimeter between XP and XSP test points on Servo PCA (A6).
		A6R48	1.95 kilohms (± 0.01 kilohms)	Connect multimeter between XV and XSV test points on Servo PCA (A6).
		A6R51	5.36 kilohms (± 0.01 kilohms)	Connect multimeter between YP and YSP test points on Servo PCA (A6).
		A6R49	1.84 kilohms (± 0.01 kilohms)	Connect multimeter between YV and YSV test points on Servo PCA (A6).



Location of Electrical Adjustments and Test Points

POSITION AND VELOCITY GAIN ADJUSTMENTS

Adjustment of the X- and Y-Axis position and velocity gains are performed as follows:

- a. Turn the plotter OFF. Remove the front table and front cover. If necessary, refer to the procedure on Opening Up the Plotter given in this section. Remove IC U38 from its socket on the X- and Y-Axis Servo PCA A6.
- b. Connect the multimeter between the XP and XSP test points on the X- and Y-Axis Servo PCA A6.
- c. Adjust the RXP adjustment potentiometer R50 on the X- and Y-Axis Servo PCA A6 for a reading of 5.64 kilohms (± 0.01 kilohms).
- d. Connect the multimeter between the XV and XSV test points on the X- and Y-Axis Servo PCA A6.
- e. Adjust the RXV adjustment potentiometer R48 on the X- and Y-Axis Servo PCA A6 for a reading of 1.95 kilohms (± 0.01 kilohms).
- f. Connect the multimeter between the YP and YSP test points on the X- and Y-Axis Servo PCA A6.
- g. Adjust the RYP adjustment potentiometer R51 on the X- and Y-Axis Servo PCA A6 for a reading of 5.36 kilohms (± 0.01 kilohms).
- h. Connect the multimeter between the YV and YSV test points on the X- and Y-Axis Servo PCA A6.
- i. Adjust the RYV adjustment potentiometer R49 on the X- and Y-Axis Servo PCA A6 for a reading of 1.84 kilohms (± 0.01 kilohms).
- j. Reinsert U38 into its socket.

ITEM 21

Except for the following part number, the Servo PCA is the same as the assembly documented in Section IV of this manual.

<u>REFERENCE DESIGNATOR</u>	<u>PART NUMBER</u>	<u>DESCRIPTION</u>	<u>CHECK DIGIT</u>
U39	1826-0510	IC LF13332N	0

ITEM 22

Except for the following part number, the Servo PCA is the same as the assembly documented in Section IV of this manual.

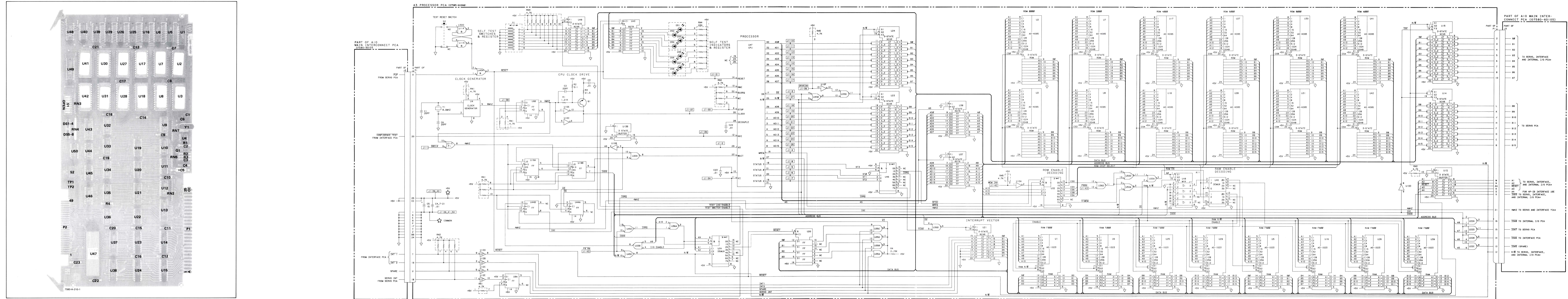
<u>REFERENCE DESIGNATOR</u>	<u>PART NUMBER</u>	<u>DESCRIPTION</u>	<u>CHECK DIGIT</u>
U22	1820-1795	IC	3

ITEM 23

Except for the following part number, the Transistor PCA is the same as the assembly documented in Section IV of this manual.

<u>REFERENCE DESIGNATOR</u>	<u>PART NUMBER</u>	<u>DESCRIPTION</u>	<u>CHECK DIGIT</u>
C1-4	0160-0153	CAPACITOR .001UF 200V	4





SECTION VI

SERVICE

6-1. INTRODUCTION

6-2. This section contains both a simplified and a functional level theory of operation, troubleshooting procedures, component location diagrams, schematics, and general service information for the Model 7580B Plotter as follows:

- Safety Considerations
- Simplified Theory of Operation
- Functional Theory of Operation
- Troubleshooting
- Recommended Test Equipment
- Repair
- Logic Symbolology and Schematic Symbols
- Service Sheets

6-3. The functional block diagram, schematic diagrams, and component location figures are shown on foldout service sheets in this section. Service information for the HP-IB/RS-232-C (Dual I/O) Interface is contained in Appendix A at the back of this manual. The service sheets in this section are identified as follows:

<u>Service Sheet</u>	<u>Title</u>
1	Model 7580B Functional Block Diagram
2	Front Panel PCA (A4) and Internal I/O PCA (A5)
3	Main Interconnect PCA (A10)
4	Processor PCA (A3)
5	X- and Y-Axis Servo PCA (A6)
6	Motor Drive Transistor PCA (A9)
7	Sensor Interconnect PCA (A8)
8	Sensor PCAs (A7, A11, A12, A13) and Interlock Switches
9	Primary Power PCA (A14) and Power Supply PCA (A15)

6-4. SAFETY CONSIDERATIONS

6-5. The Model 7580B Drafting Plotter has been designed in accordance with accepted safety standards.

Safety symbols used with Hewlett-Packard instruments are illustrated on page v of the front matter in this manual. These symbols should be reviewed before service work is performed. Servicing should be performed only by qualified service personnel.

6-6. SIMPLIFIED THEORY OF OPERATION

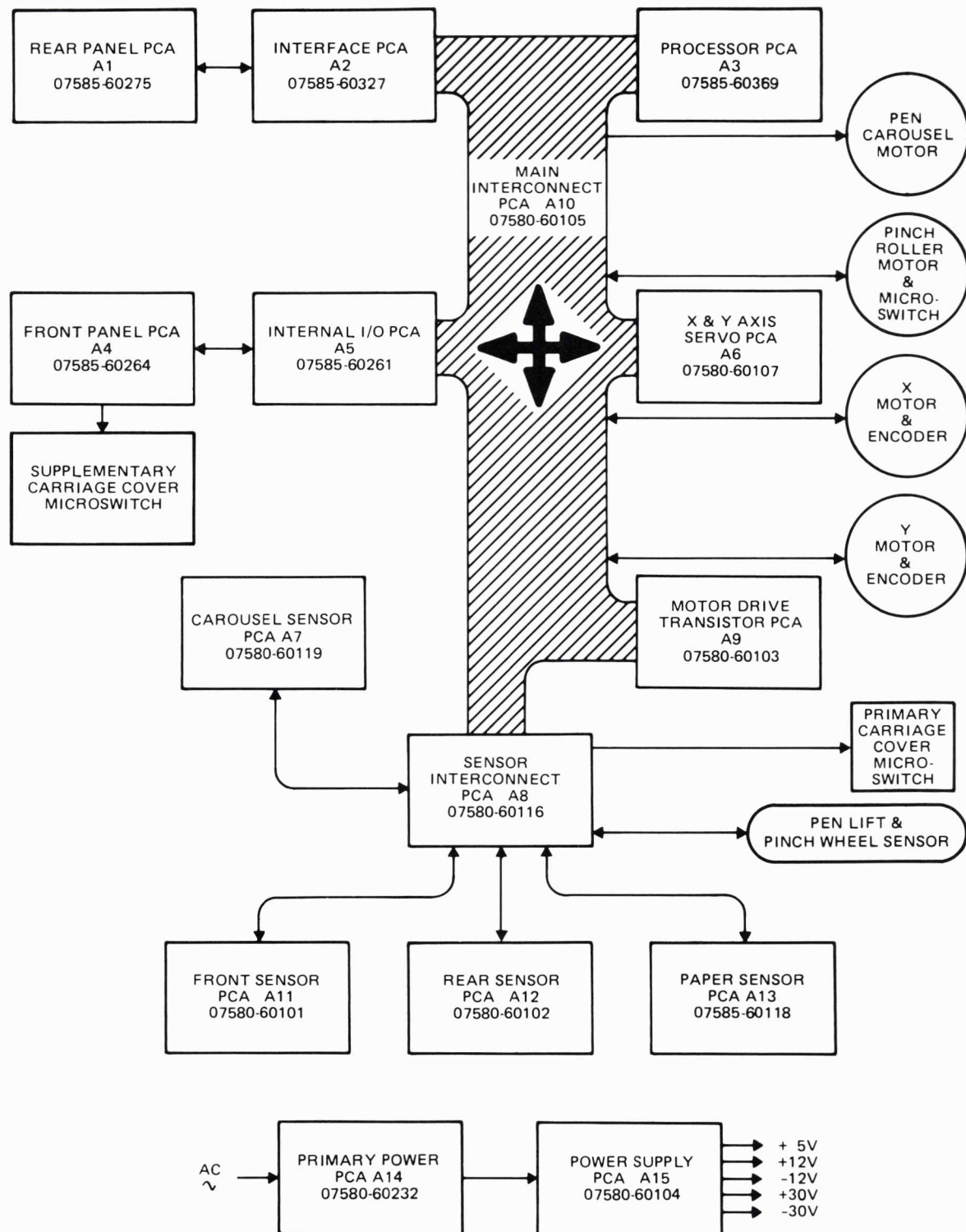
6-7. This simplified theory of operation is provided as an introduction to the plotter system at a simplified block diagram level. See Figure 6-1. The theory for the HP-IB/RS-232-C (Dual I/O) Interface is contained in Appendix A at the back of this manual. The Rear Panel and Interface PCAs perform data transfer, interfacing, and any necessary data conversions for internal plotter use.

6-8. Data transfer is controlled by the Processor PCA which generates the appropriate timing signals to properly sequence the processing of data and instructions. The Read Only Memory (ROM) on the Processor PCA stores the system executable instructions and data constants which the processor accesses and interprets. The Random Access Memory (RAM) on the Processor PCA is used for temporary storage of processor calculations and input/output data. The processor/memory is used to translate the input graphic language to the plotter internal control language.

6-9. The Front-Panel PCA provides a means of manually entering X- and Y-position data, pen control and selection, and chart hold control data to the plotter Internal I/O PCA for processing. Alphanumeric displays of the pen selected, pen force, and pen speed are also present on the front panel.

6-10. Interfacing between the front-panel circuits and the plotter bus is provided by the Internal I/O PCA. Analog signals from the front-panel joystick are converted into digital signals, and with front-panel status, paper, pen, and carousel sensor information, is input to the processor for interpretation. Information from the processor is decoded for the pen carousel, pen lift, and pinch wheel drive circuits.

6-11. The Servo PCA transfers position and velocity encoded information for the X- and Y-motors onto the data bus for processor interpretation and to the DAC for conversion into analog signals which are amplified and input to the X- and Y-motor drive transistors. Digital data received back from the processor is used for comparison and error detection and also converted into analog signals which are used by the X- and Y-motors for compensation. Power-up failure and interrupt detection circuits provide a means of plotter operation intervention should such information be received from the Internal I/O PCA.



7580-A-10-6

Figure 6-1. Model 7580B Simplified Block Diagram

6-12. The power drivers on the Motor Drive Transistor PCA provide the voltage and amplification for the analog signals from the Servo PCA to drive the X- and Y-motors and pen lift circuit.

6-13. Sensor PCAs utilizing photo-transistor assemblies detect media size, carousel presence, carousel type, pen presence, and pen height for pen carriage and carousel initialization, and setting other plotter parameters.

6-14. The Power Supply PCA converts the line input ac voltage in a switching regulator to the required dc voltages to drive the motors and plotter electronics.

6-15. FUNCTIONAL THEORY OF OPERATION

6-16. The functional theory of operation is a block diagram description (see Service Sheet 1) which presents a detailed overview of the Model 7580B Drafting Plotter operation. A detailed description of each of the major blocks is given with reference to the corresponding service sheets. Simplified block diagrams of each of the major PCAs is included to facilitate understanding of the detailed descriptions.

6-17. Theory for the Rear-Panel PCA A1 and Interface PCA A2 is contained in Appendix A at the back of this manual.

6-18. FRONT-PANEL PCA A4 AND INTERNAL I/O PCA A5

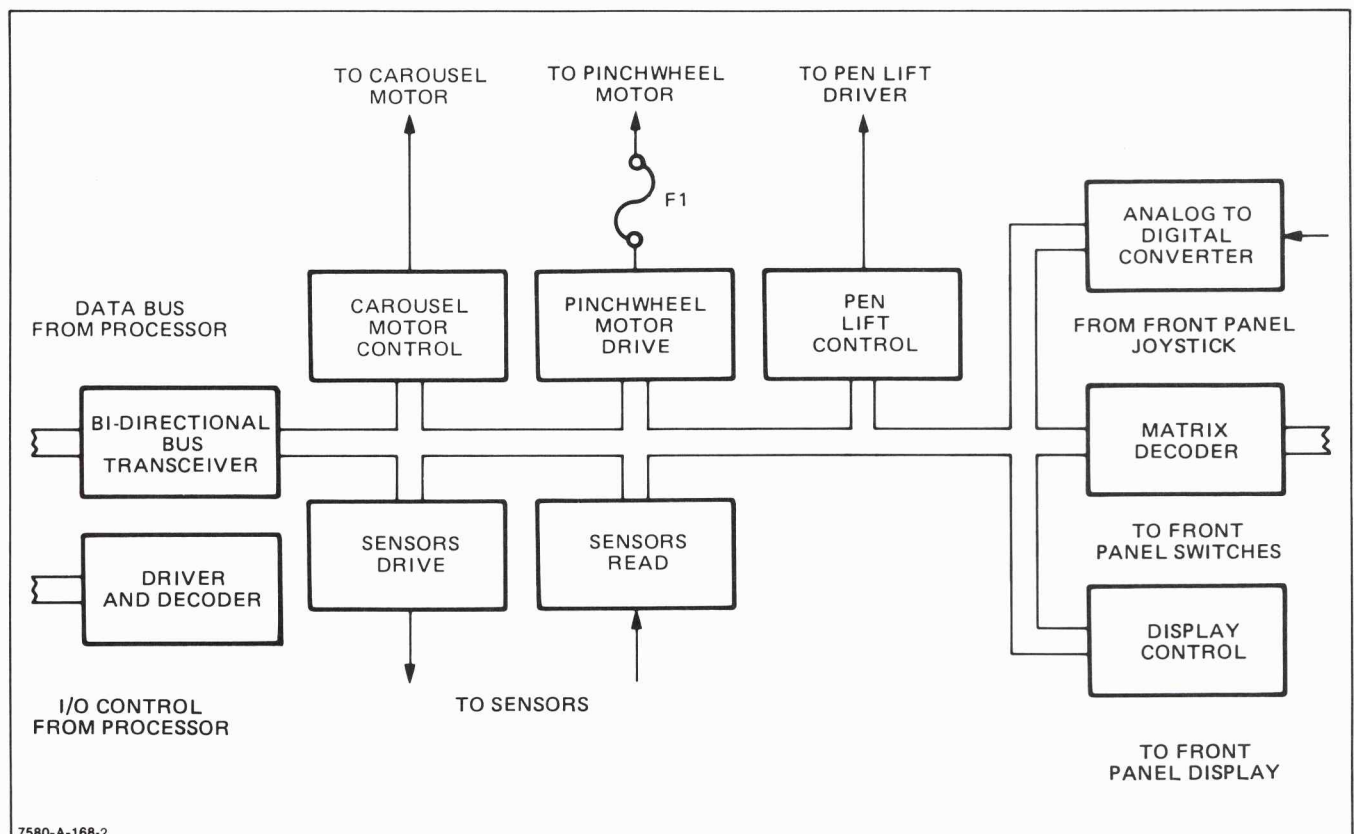
6-19. A twenty-three pushbutton switch matrix on the front panel allows the operator to manually enter pen

position data, pen selection and pen control data, chart hold information, and plotter limits. Pressing any of the pushbuttons causes the corresponding matrix line to go low. This low is input and inverted through the matrix status register U4 on the Internal I/O PCA and the information put on the data bus for interpretation and processing. See Service Sheet 2. A simplified block diagram of the Internal I/O PCA is shown in Figure 6-2.

6-20. The processor receives this information on the data bus and generates appropriate address and data strobe signals which are input back to demultiplexer U3 on the Internal I/O PCA. U3 interprets the signals from the processor and enables the matrix, blanking, and display registers. Tri-state buffer U1 provides buffering of the input signals from the Processor PCA to U3.

6-21. Front-panel pushbutton status on the data bus is read back through switch matrix drive register U20, buffered by U21, and sent to the appropriate indicator lamp on the front panel. LED and blanking latch U23 performs a similar function. Display latch U8 uses the information on the data bus to drive the alphanumeric (A/N) display on the front panel for plotter status and troubleshooting purposes.

6-22. Analog signals from the front-panel joystick are input through the X-Y analog switch U32 and amplified by U29. These analog signals are converted into digital information for use on the data bus by analog to digital converter (ADC) U30. The digital signals are driven to the Processor PCA by bidirectional interface bus driver U2. A two-pin molex connector, J3, provides the signal



7580-A-168-2

Figure 6-2. Internal I/O PCA Simplified Block Diagram

path to the Internal I/O PCA for the supplementary carriage cover microswitch. This signal invokes an interrupt should the carriage cover be raised to the open position.

6-23. The pinch wheel and carousel motor drive register U11 is clocked by signals from demultiplexer U3. Data from the processor on the data bus is input to the pinch wheel circuit and carousel motor supply switch U5 through U11. During media loading or unloading, data to the pinch wheel circuit is used to control the pinch wheel drive for raising or lowering the pinch wheels. When pinch wheel drive is required, the output from U11 causes zener diode VR1 to bias Q4 ON. When Q4 is conducting, Q3 is turned ON and pinch wheel drive is supplied to the pinch wheel motor circuit. As the pinch wheel camshaft rotates, the pinch wheel cam closes the pinch wheel microswitch, signaling when the pinch wheels are down. This signal causes Q2 to turn ON which shuts down the pinch wheel drive circuit.

6-24. During initialization or pen selection, drive to the pen carousel motor is taken off the data bus, through U11, and fed to the carousel motor Darlington switch U5. The signals sent through U5 supply the drive for the carousel motor windings.

6-25. The carousel sensor drive circuit supplies the signal to the pen carousel initialization sensor, the pen and carousel sensors, and also is used to clock the pen carriage and carousel initialization sensor drive register U27. Output from the carousel drive timing clock, U31, is used to turn ON transistor Q9 which, in turn, inputs to the carousel sensor drive amplifier, U24. The output from U24 turns ON transistors Q6 and Q7 and supplies the drive to the pen and carousel sensors.

6-26. During initialization, the carousel initialization sensor photo-transistor detects the initializing reflective strip on the carousel. The signal is sent to the negative input of U24B causing the carousel initialization sensor drive to turn OFF which stops the carousel in the initialize position. Pen and carousel sensor returns to U24B perform similar functions for the pen and carousel sensors.

6-27. Pen carriage initialization, carousel initialization, pen in carousel, and carousel present sensor information is amplified by U24 in the pen carriage and carousel initialization sensor drive circuit and clocked through registers U27 and U31 to the data bus for processing by the Processor PCA.

6-28. The paper sensor timing circuit generates the paper sensor source signal used by the front and rear paper sensors. These sensors determine whether or not media is present and also determine the media size in the media transport (X) axis.

6-29. Timer U15 generates a square wave with a period of approximately 80 microseconds to clock divide by two flip-flop U16. The Q output of U16 is a 50% duty cycle square wave with a period of 160 microseconds. This square wave output drives transistor Q8. The collector of Q8 is connected through R65 and the front and rear paper sensor light emitting diodes to +12 volts. This arrangement simultaneously pulses the sensor LEDs ON and OFF about 6,250 times per second.

6-30. The photo-transistor outputs of the front and rear paper sensors return to R103 and R102, respectively, on the Internal I/O PCA. These potentiometers develop voltages at pin 15 and pin 10 of analog switch U9. These voltages are a function of the amount of reflected light from the paper sensors. With no media present, the voltages at U9-10 and U9-15 are zero. With media present, the voltage at these pins appears in the form of a triangular waveform. The voltage levels are adjusted by R102 and R103.

6-31. Register U11 uses data from the processor to energize analog switch U9. When the output at U11-9 goes high, the front paper sensor signal return is applied through U9 to the junction of C20 and R31. When U11-9 is low, the rear paper sensor signal return is applied similarly.

6-32. The triangular waveform from the paper sensors is transformed by C20 and R27 into a square wave centered around 0 (zero) volts and input to U14A. The output of U14A is applied to a summing amplifier comprised of U14C, R32, R35, R39, and C24 either through R28 direct or through inverter U14B. During the time the LED of the selected paper sensor is ON, the square wave output of U16-5 activates the enable input at U9-1 grounding the output of U14B. Thus the output of U14A, which is positive during this time if media is present, is input to U14C via R28. A square wave which is the inverse of the square wave that is driving Q8 is available at U16-6. During the time the LED of the selected paper sensor is OFF, this signal, which is applied to the enable input at U9-8, is high thereby grounding the output through R28. Thus the output of U14A, which is negative during this time if media is present, is input to U14C through inverter U14B. As a result, the output of U14C is approximately -12 volts with media present and approximately 0 (zero) volts when no media is present.

6-33. Pin 12 of U14D is held at -4.9 volts by a voltage divider network comprised of R30 and R33 while the output of U14C is applied to pin 13 of U14D. U14D operates in an open loop configuration so that its output is approximately +12 volts with media present and -12 volts with no media present. Clamping diodes CR5 and CR7 clamp this output at 0 (zero) volts with no media present and at +5 volts with media present for compatibility with TTL signal levels. This signal is then routed through U31 to the Processor PCA for processing.

6-34. Pen position, damping, lift, and force circuits on the Internal I/O PCA control the pressure of the pen on the media, pen bounce, and the level of pen lift. A simplified diagram of the Model 7580B pen lift circuitry is shown in Figure 6-3. This pen lift system acts as a closed loop adaptive servo system featuring a low mass "voice coil" actuated mechanism moving vertically on a linear ball bushing. An optical position sensor senses the actuator position relative to the pen lift carriage frame. This position sensor consists of an LED/photo-transistor pair fixed into the carriage such that their optical path can be partially blocked by a small flag attached to the pen actuator. This optical sensor pair is temperature compensated so that the photo-transistor output current is desensitized to temperature changes which affect the LED optical output.

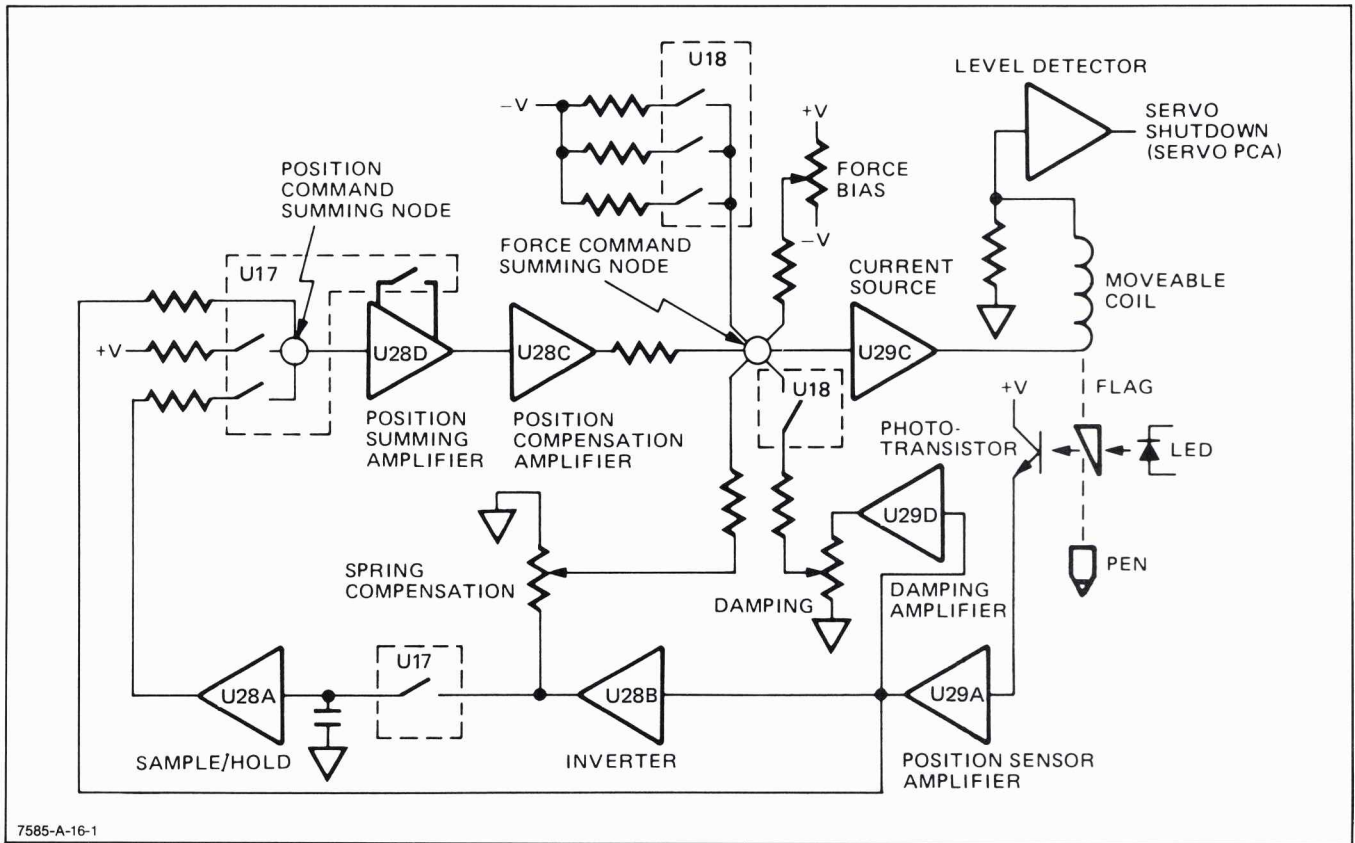


Figure 6-3. Model 7580B Pen Lift Simplified Diagram

6-35. The output of the position sensor is inverted and stored in an analog S/H (sample and hold) circuit to represent the pen position just prior to the last pen lift. The pen control system operates in four different microprocessor controlled modes. The first mode is a cascade compensated position control loop that is used to raise the pen during pen lift operations. The input signals for this loop, SHORT LIFT and SHORT LIFT MOD, are controlled by analog switch U17. With both of these switches open, the control system lifts the pen until the sensor output is approximately zero. To lower the pen, a velocity control loop, LOOP CONTROL, is implemented by closing the switch inputs at U17-9, U18-1, and U18-8 while simultaneously opening all other switches in U17 and U18. LOOP CONTROL disables the position control loop by setting the position loop gain to zero. In the velocity control mode, FORCE 10 at U18-8 applies a force input while DAMP CONTROL at U18-1 enables a velocity feedback signal. The result is that the pen is lowered at a constant rate of speed.

6-36. Eight levels of pen force are set by microprocessor control and available at analog switch U18 pins 8, 9, and 16. These switches are connected to binary weighted current sources which are applied to the input of the current controlled current source output amplifier U29C. This results in a constant force since the voice (pen) coil force is independent of position. Other inputs to U29C are the force bias adjustment and the power-off pen up spring compensator. The spring compensator circuit, U28B, feeds back a signal that is proportional to the actuator position and minimizes the effects of the power-off pen up spring upon the commanded force. When the

microprocessor sets the force it also opens U18-1 DAMP CONTROL, which disables the velocity feedback path. While plotting U17-9 LOOP CONTROL which disables the position loop, and U17-1 SAMPLE which sets the platen height sample/hold to the sample state, are the only switches closed in addition to the force select. This sample/hold follows the pen position as the pen moves in the lowered position. The sample/hold will be placed in the hold state when the next pen up command is executed.

6-37. A safety shutdown circuit comprised of U6A and U6B prevents damage to the voice coil due to excessive power dissipation should a malfunction in the pen lift control system occur.

6-38. An Electrically Alterable Read Only Memory (EAROM), U13, provides non-volatile storage for constants which are used to compensate for mechanical tolerances. A self-test checksum scheme determines if the EAROM contents are intact. The processor calculates the EAROM upon power up. If the checksum is correct, the constants are written into RAM for accessing by the compensation code. If the checksum is not correct, default values already stored in ROM are used as the constants.

6-39. MAIN INTERCONNECT PCA A10

6-40. The Main Interconnect PCA provides the internal connection between the various photo sensors, printed circuit assemblies, and the drive motors. See Service Sheet 3.

6-41. Resistors R1 and R2 supply power to the two windings of the stepping motor used to rotate the pen carousel. While the carousel motor is stationary, power for the motor windings is obtained through R3 and pin 1 of J12 from the 20 V regulator on the Motor Drive Transistor PCA A9. Whenever the carousel motor is rotating, Q1 is turned ON by Q1 and R2 on the Internal I/O PCA A5, bypassing Q7 and increasing the power delivered to the carousel motor. Thus, the holding power delivered to the motor is less than the power for rotation.

6-42. Relay K1, when energized, feeds the output voltages from the paper axis, pen axis, and pen lift amplifiers on the Motor Drive Transistor PCA A9, to the X- and Y-axis drive motors and the pen coil. The relay is energized by the motor shutdown relay drive latch circuit on the Servo PCA A6. The motor shutdown relay drive latch also removes the drive from the motors and the pen coil when certain malfunctions are detected.

6-43. PROCESSOR PCA A3

6-44. The Processor PCA, illustrated on Service Sheet 4, contains the microprocessor, the bus timing and control logic, 160K bytes of read only memory (ROM), 24K bytes of random access memory (RAM), I/O control logic, self-test I/O registers, and the vectored interrupt priority logic. A simplified block diagram of the Processor PCA is shown in Figure 6-4.

6-45. The microprocessor (U23) has a 16 bit time multiplexed address and data bus. When the \overline{AS} (ADDRESS STROBE) control line is low, the microprocessor drives

the address information onto the bus. The address information is stable when the \overline{AS} line returns to its high state. \overline{AS} is the master sync signal for the system. There is always an ADDRESS STROBE for every machine cycle of the microprocessor. For internal operations where the address data is not necessary, there is an \overline{AS} pulse even though no \overline{DS} (DATA STROBE) pulse is present.

6-46. ADDRESS BUS. The address information is stored in latches U41 and U42. The outputs of the address register are the drivers for the Processor PCA address bus. The processor uses addresses 1-15 to select a word. ADDRESS 0 is used to select the upper or lower byte of the word. After the address information is removed from the bus by the microprocessor, data information is ready to be placed on the bus. Data is written onto the bus while the \overline{DS} (DATA STROBE) control line is low. The data is stable on the bus on the rising edge of the DATA STROBE pulse.

6-47. TIMING AND CONTROL. See Figure 6-5. The type of data information which is to be conveyed is determined by the status lines (ST0-ST3), the control lines R/W (READ/WRITE), MREQ (MEMORY REQUEST, B/W (BYTE/WORD), and \overline{DS} (DATA STROBE).

6-48. The status lines give the status of the microprocessor for each machine cycle. The decoder (U36) decodes the I/O states, and VECTORED INTERRUPT ACKNOWLEDGE.

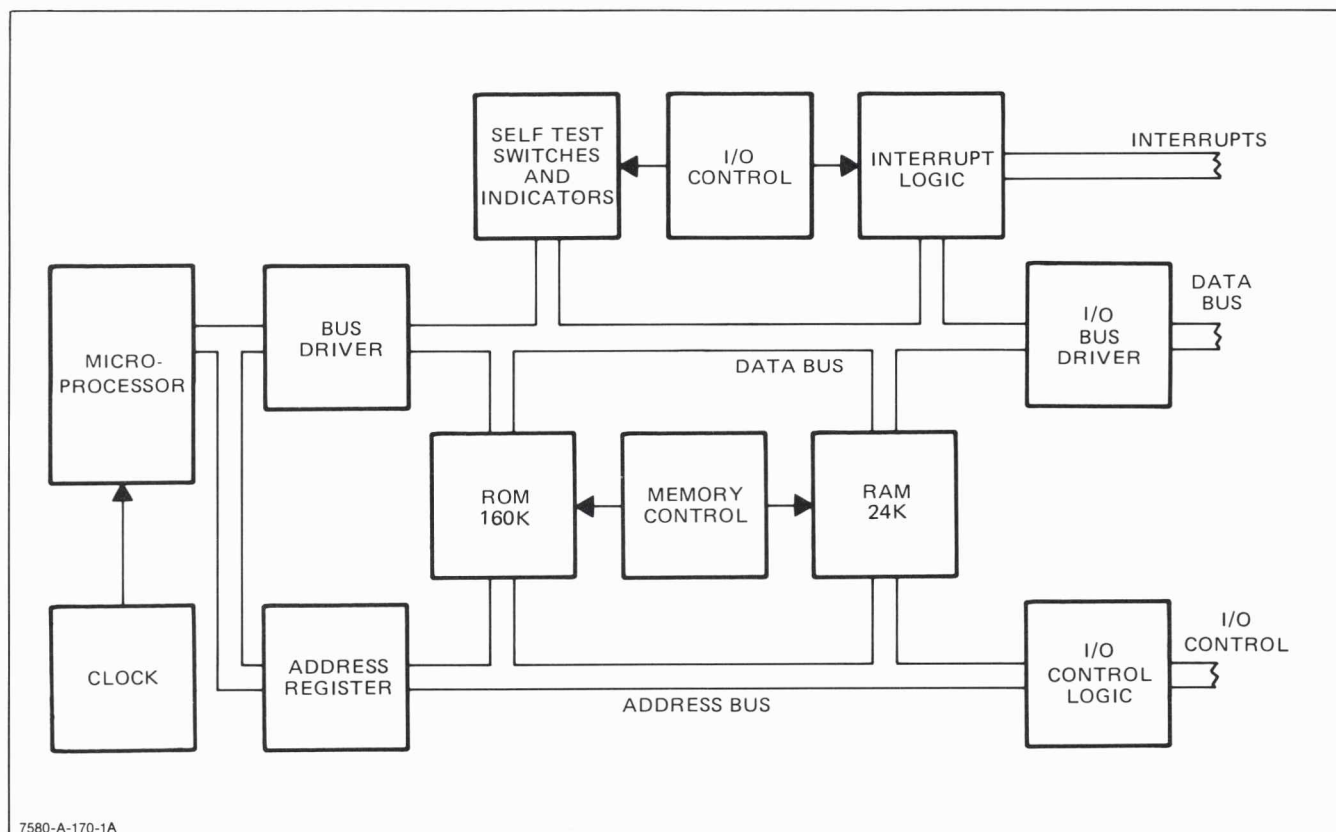
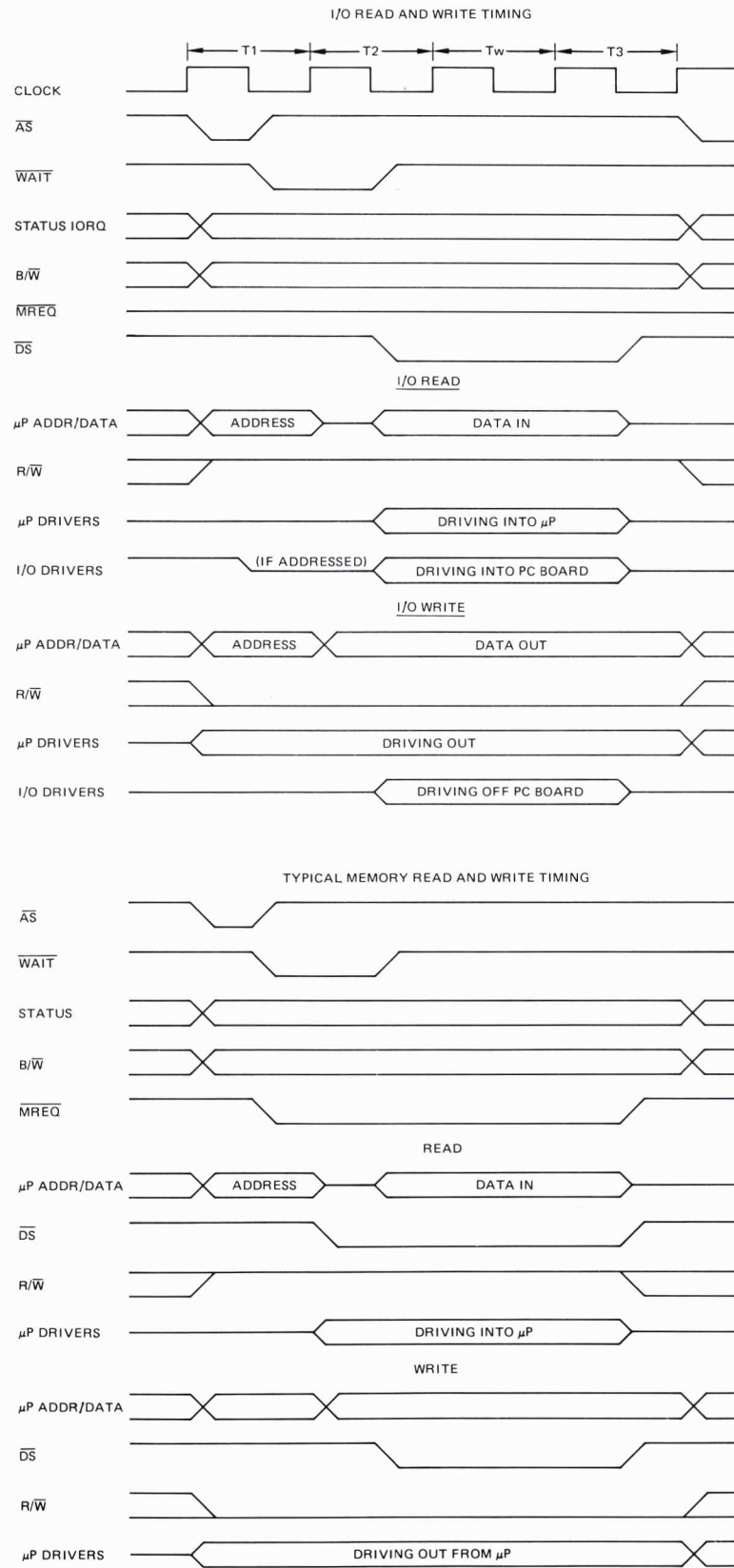


Figure 6-4. Processor PCA Simplified Block Diagram



7580-B-100-1

Figure 6-5. Timing and Control Diagram

6-49. READ/WRITE (R/\bar{W}) determines whether the microprocessor is receiving data (READ operation) or is transmitting data (WRITE operation) onto the bus. The R/\bar{W} control line is used throughout the system to determine the direction of the individual bus drivers. The processor is reading data when the R/\bar{W} is in the high state.

6-50. The MEMORY REQUEST (\overline{MREQ}) control line differentiates memory requests from other types of requests, as for example, I/O or internal operation requests. A selected ROM's output is enabled when the \overline{MREQ} pulse is low.

6-51. The BYTE/WORD (B/\bar{W}) function allows the microprocessor to manipulate data in either a byte or word format. ADDRESS 0 determines which byte of the word is selected. B/\bar{W} is useful when handling data from a byte oriented I/O such as HP-IB.

6-52. The DATA STROBE (\overline{DS}) control line is for transferring data between the microprocessor and other devices connected to the bus. For WRITE operations, the rising edge of the \overline{DS} pulse is used to clock data into the receiving device. For READ operations, the \overline{DS} pulse is used to place data onto the bus. The microprocessor accepts the data on the rising edge of the clock, just before the \overline{DS} pulse returns to its high state.

6-53. WAIT is the asynchronous control signal which allows the microprocessor to handshake with devices slower than itself.

6-54. The oscillator (U37) for the system provides a crystal controlled 4.0 MHz square wave.

6-55. The microprocessor bus drivers (U15, U16) are used to satisfy the loading requirements of the microprocessor and also to isolate the microprocessor from the data bus for testing purposes. The bus driver direction is controlled by the R/\bar{W} line with the drivers driving into the microprocessor on a WRITE command (R/\bar{W} low). The bus drivers are always enabled during a WRITE, but only during the DATA STROBE pulse during a READ.

6-56. MEMORY. The microprocessor is capable of addressing 184K bytes of memory. The system uses the first 160K bytes for ROM and the last 24K bytes for RAM. Memory sections are decoded in 16K word segments by the decoder (U36).

6-57. The RAM is addressed at the high end of memory as decoded by the decoder (U36). The RAM is further broken up into 2K words and then the words into upper and lower bytes. For a WRITE operation, the microprocessor sends out a full word of data though only one byte is used. U23 and U25 also select the RAM devices to the byte level on a WRITE command.

6-58. INPUT/OUTPUT CONTROL. The I/O bus consists of the bus timing and control signals, the four device address lines, sixteen bidirectional data lines, and the interrupt request logic. Each PCA on the bus has its own bus driver to buffer its data from the main I/O bus. The I/O bus timing and control logic is controlled by the microprocessor. The microprocessor is capable of addressing 184K bytes of individual I/O ports. Each PCA is assigned its own address line. All other high order address lines are zero. The low order address lines A1-A4 are used to select any one of up to sixteen address ports available.

6-59. The I/O bus direction is controlled by the READ/WRITE (R/\bar{W}) line. The selected I/O PCA bus drivers are enabled during the IOC (I/O CONTROL) pulse and the individual I/O devices by the DATA STROBE (\overline{DS}) pulse. The I/O PCA is chosen when its high order address is high. This enables the bus drivers in the direction specified by the R/\bar{W} line. The specified I/O device is enabled when the address decoder, determined by A1-A4, selects it. The decoder sends out the \overline{DS} pulse to the device. The device uses the rising edge of \overline{DS} to store data for a WRITE or transfers data onto the bus when \overline{DS} is low on a READ.

6-60. The I/O CONTROL (\overline{IOC}) signal prevents the data lines from floating before the I/O device stores the data and increases the access time for I/O devices by enabling the bus drivers before the \overline{DS} pulse begins. \overline{IOC} is gated (U5) with address lines A5-A7 to form the four I/O PCA bus enables.

6-61. PROCESSOR INPUT/OUTPUT. The I/O registers on the Processor PCA are the self-test switch register (U43, S1), the self-test display register (U44, DS1-8), the interrupt mask register, and servo interrupt request clear control signal.

6-62. The I/O registers are selected by the I/O decoder, U5. The self-test switch register is used to select a test, and the results are displayed on the eight LEDs of the display register. The most significant position of the switch register is used as the flag to cause the microprocessor to enter Self-Test.

6-63. INTERRUPT. The system uses three methods of interrupt: RESET, NON-VECTORED (NVI), and VECTORED INTERRUPT (VI).

6-64. RESET suspends all microprocessor operation; the program counter is cleared, and the data and control lines are placed in their high impedance state. When RESET returns to its high state, the processor begins operation at location zero. A RESET may be generated by a POWER ON signal from the Servo PCA or by the manual reset switch (S2, U35) on the Processor PCA. A RESET pulse also forces the self-test LEDs into the illuminated state.

6-65. NON-VECTORED INTERRUPT is connected to the microprocessor from the rear-panel confidence switch

through a buffer gate, U34. When enabled, the \overline{NVI} always immediately enters the confidence test subroutine.

6-66. **VECTORED INTERRUPT** means the microprocessor points to a unique location in memory, depending on the data stored in the vectored interrupt jump register. The jump register has the information informing the processor which I/O device is requesting an interrupt.

6-67. The vectored interrupt logic is broken down into the interrupt request logic and the interrupt acknowledge logic. The request logic consists of the input inverters (U28), the mask register (U13), and the interrupt request gates (U21). The mask register allows the firmware to selectively inhibit any I/O device from requesting an interrupt.

6-68. The servo interrupt has an added flip-flop (U29). The input interrupt signal is a 1.0 kHz square wave, which must be converted to a handshaked pulse so as to prevent the microprocessor from continually interrupting itself. The flip-flop is set when the input waveform goes low (inverted in U28) and is cleared at the time the servo routine is entered.

6-69. After the microprocessor has detected a vectored interrupt, it reads the jump vector and enters the proper I/O subroutine. It does this by sending a vectored interrupt acknowledge out on the status lines. The status decoder (U36) sends an enable signal for the jump vector register (U14); on \overline{DS} , the jump vector register is enabled to drive the bus, and the jump vector data is read by the microprocessor.

6-70. X- AND Y-AXIS SERVO PCA A6 AND MOTOR DRIVE TRANSISTOR PCA A9

6-71. The X- and Y-Axis Servo PCA and Motor Drive Transistor PCA, illustrated on service Sheets 5 and 6 respectively, provide the control, error, feedback, and amplified signals to drive the X- and Y-axis drive motors. A simplified block diagram of the Servo PCA is shown in Figure 6-6.

6-72. A dual rate sampled data servo system controls the movement of the dc motors used for pen positioning in both the media (X) axis and the pen (Y) axis. A slow rate loop provides position data from optical encoders on the motor shafts to the processor and a fast rate loop provides velocity data for damping the system. For each axis, the processor is updated with the position every 1 ms and, after subsequent calculations, outputs an error signal corresponding to the difference between the desired and actual positions of the pen in that axis. Meanwhile, the damping loop is updating the estimated velocity every 200 μ s which tends to minimize erroneous movement caused by the sampling delay in the slow-rate loop.

6-73. Servo PCA A6 basically consists of a clock circuit, encoded pulse processing circuit, position counter, velocity estimator, multiplexer, DAC, sample and hold circuits, gain control circuits, amplifiers, a safety circuit, and interfacing circuitry connecting it to the microprocessor bus.

6-74. **CLOCK CIRCUIT.** Various clock signals used by the servo circuitry are developed from the 4 MHz clock

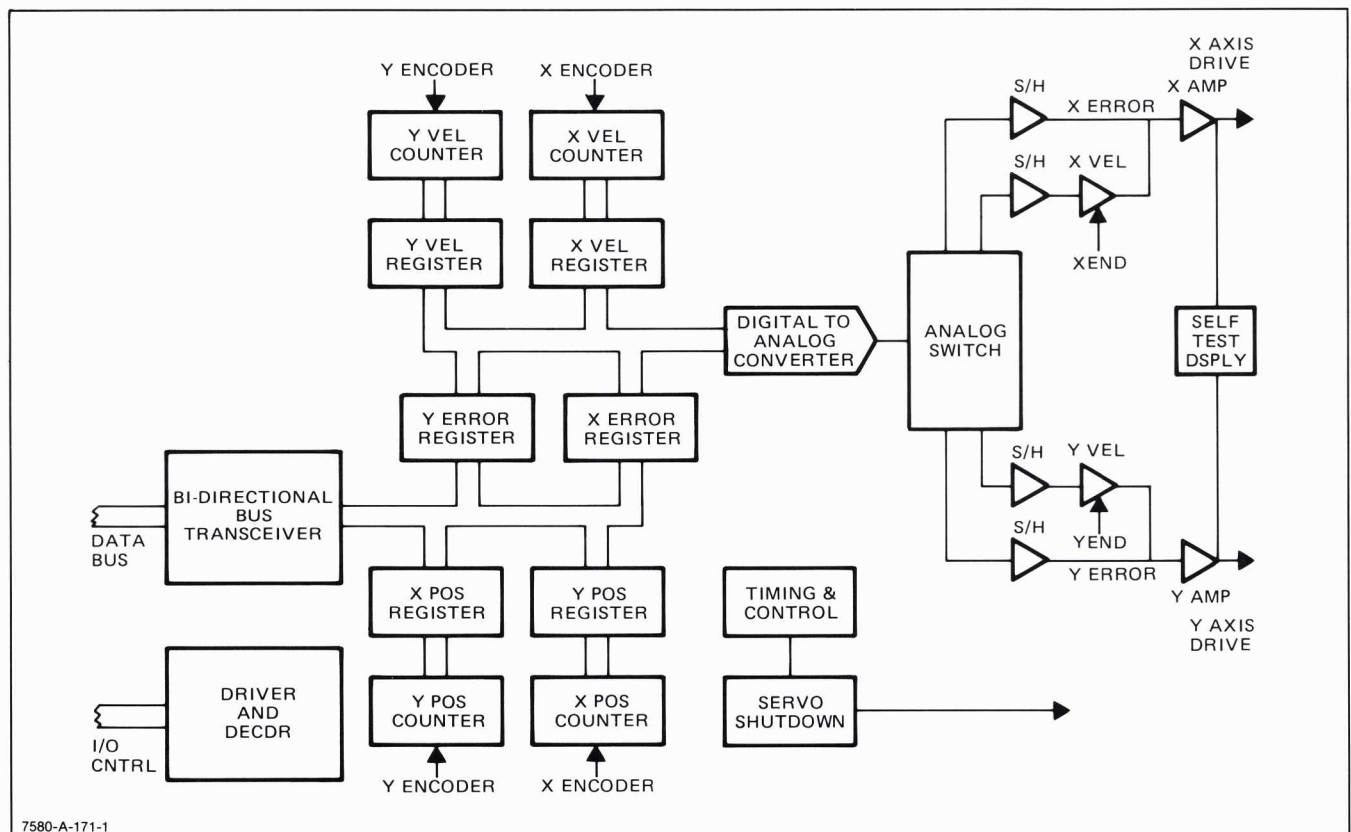


Figure 6-6. X- and Y-Axis Servo PCA Simplified Block Diagram

obtained from the Processor PCA through pin 21 of P1. This signal is down-counted by U16B and U16A to provide 2 MHz and 1 MHz signals, respectively. Additionally, U24 and U31 further down-count the 1 MHz clock to provide 200 kHz, 100 kHz, 50 kHz, 25 kHz, 5 kHz, and 1 kHz clock signals. U25D, U17B, U26D, and U18D develop CCLK, the clock signal for the X- and Y-position counters which is also supplied to the X- and Y-velocity counters through U26C and U34F. U17A, U25B, and U26A develop VXYL, the velocity count loading signal. Its inverse, used to clear the velocity count, is developed by U18C.

6-75. **ENCODER PULSE PROCESSING CIRCUIT.** In addition to providing pulses directly related to the rate of rotation of the servomotors, the encoders must be able to sense the direction of rotation of the motors. Each encoder has two outputs consisting of pulses that are 90° out of phase. Output A leads output B by 90° for one direction of rotation. These pulses reach the servo PCA through pins 4 and 5 of P2 for the X-encoder and pins 2 and 3 for the Y-encoder and are processed through U2, U9, U10, U34C, and U34E. The outputs of U10C and U10B, \overline{XEN} and \overline{YEN} , are pulses four times the frequency of the X- and Y-encoder pulses, respectively. Representing the rate of rotation of the X- and Y-motors, these signals are used by the X- and Y-position and velocity counters. The outputs of U34E and U34C, \overline{XUD} and \overline{YUD} , indicate the direction of rotation of the X- and Y-motors and are also used by the counters. During the low segment of the \overline{XEN} and \overline{YEN} pulses, these outputs are high for one direction of rotation and low for the opposite direction.

6-76. **POSITION COUNTER.** Counters U21, U14, and U7 form a twelve bit position counter whose output continually follows the rotation of the X-axis servomotor and is used to feed position data to the processor. The ripple clock outputs (pin 13) of U21 and U14 each feed the clock input of the next most significant device, allowing it to start up when overflow occurs. The load inputs (pin 11) are connected through pull-up resistors to +5 V because the counters are never cleared and the preset inputs are connected to common. \overline{XEN} , the signal from the encoder pulse processing circuit, is applied to the enable input (pin 4) of each device. When this signal is a low level, the CCLK clock signal at pin 14 of U21 causes the count to proceed. If \overline{XUD} , which is applied to the up/down input (pin 5) of each device, is low at this time, the counters count up, whereas a high level causes them to count down.

6-77. The output of the position counter feeds an X-position register comprised of U12 and U13. A low to high transition at pin 11 of these devices causes the current position count to be loaded in the register. Every 1 ms, the processor sets pin 1 of U12 and U13 to a low level, enabling their outputs so that the count can be read through bidirectional bus transceivers U5 and U6.

6-78. The Y-axis position counters U44, U37, and U30 and the Y-axis position registers U19 and U20 function similarly to their X-axis counterparts.

6-79. Once the processor has read the current position, it calculates an error signal corresponding to the amount by which it differs from the desired position. This information is placed on the bus and is loaded into the X-error

register comprised of U28 and U29 upon a low to high transition to \overline{XECLK} applied to pins 11 and 7, respectively. \overline{XECLK} is supplied by the processor, which updates the X-position error register every 1 ms.

6-80. Every 40 μ s, the low level of signal \overline{XERR} at pin 1 or U28 and pins 1 and 2 of U29 outputs the X-position error information to the servo DAC, U45. The Y-position error register, comprised of U35 and U36, functions similarly to its X-axis counterparts.

6-81. **VELOCITY ESTIMATOR.** Counters U43 and U41 form an eight-bit counter whose output is used to estimate the X-axis velocity. the \overline{XEN} and \overline{XUD} signals from the encoder pulse processing circuit govern its operation which is similar to that of the X-axis position counter except that it is reset to zero after each reading of the count. Every 200 μ s, the counter output is loaded into the X-velocity estimator U42 by the low to high transition of the VXYL signal from the clock circuit at pin 11. A low level at pin 11 of the counters, provided by the VXYL signal, then clears them in preparation for the next velocity estimation count. Every 40 μ s, the low level of signal \overline{XVEL} at pin 1 of U42 outputs the velocity estimation count to U45, the servo DAC.

6-82. Whenever velocity estimation data is being input to the servo DAC, driver U27 sets the three least significant bits of the DAC input to zero. The Y-velocity counter, comprised of U48 and U47 and the Y-velocity estimator register, U46, function similarly to their X-axis counterparts.

6-83. **DIGITAL TO ANALOG CONVERTER (DAC).** U34B, U45, U40B, and U40C comprise a bipolar 10-bit DAC that converts the digital X-position error, Y-position error, X-velocity estimation, and Y-velocity estimation data into analog signals for the motor drive circuitry. R70, the offset adjustment of the DAC, is set for a 0 V output with a logical 0 input to the DAC.

6-84. **MULTIPLEXER.** A multiplexer consisting of U32, U33, U15A, U25A, and U25C generates the 25 kHz \overline{XVEL} , \overline{YVEL} , \overline{XERR} , and \overline{YERR} signals from the 25 kHz, 40 kHz, 100 kHz, and 200 kHz clocks. These signals sequentially enable the outputs of the X- and Y-velocity estimator and position error registers, applying their contents to the input of the servo DAC. Depending on which one of these inputs is applied to the DAC, analog switch U39 connects the DAC output to the corresponding sample and hold for that input. The four switches in U39 are individually closed by enabling signals obtained from pins 9, 10, 11, and 12 of U33. The timing of these signals is such that the analog signal path to the sample and hold is made 1.5 μ s after the digital input is available to the DAC. Also, the analog signal path is opened 1.5 μ s before the digital input to the DAC is changed, keeping transient signals from reaching the sample and hold circuit.

6-85. **SAMPLE AND HOLD.** Four sample and hold circuits consisting of U38A, U38B, U38C, and U38D and storage capacitors C30, C31, C37, and C38 receive the analog signals from the DAC. U38B and U38C are for X-position error and Y-position error, respectively, while U38A and U38D are for X-velocity feedback and

Y-velocity feedback. Each circuit holds the last value of its respective signal until that signal is updated.

6-86. **GAIN CONTROL CIRCUITS.** X-position error data from the sample and hold circuit is applied to the X-servo amplifier through R54 and R50 and Y-position error data to the Y-servo amplifier through R55 and R51. R51 adjusts the Y-position gain.

6-87. X- and Y-velocity feedback data is applied to the servo amplifiers through X-velocity feedback amplifier U23A and Y-velocity feedback amplifier U23B, respectively. The X- and Y-position and velocity gain compensate for various parameters, such as inertia of servomotors of different types that may be used with the servo system.

6-88. R24 in the feedback loop of the X-velocity amplifier U23A can be bypassed by analog switch U22A, reducing the gain of the amplifier. When the desired position in the X-axis is reached, the processor supplies an XEND signal at pin 10 of U3 which enables U22A. The resulting gain reduction in U23, along with gain reduction implemented in the processor firmware, reduces the amount of overshoot of the desired position. A YEND signal supplied by U3 controls the Y-velocity gain in a similar manner.

6-89. **X- and Y-SERVO AMPLIFIERS.** Amplifier U23D, transistors Q4 and Q6, and the complementary-symmetry output pair Q1 and Q2 on the Motor Drive Transistor PCA provide the voltage and current gain

necessary to drive the X-axis motor. Analog switch U22D, when closed, applies the output of U23 to Q4 and Q6. When the servo is shut down, this switch opens, preventing transient signals from causing undesirable motor movement. S1 allows U22D to be bypassed for testing purposes. S2, also used for certain tests, allows the servo loop to be opened by removing the drive signals from the output transistors. R68 adjusts the dc offset of the X-servo amplifier and is set for a 0 V output at test point XA with 0 V at the input. In normal operation, the output from Q1 and Q2 on the Motor Drive Transistor PCA is applied to the X-motor by relay K1. This relay opens and removes motor drive under certain conditions.

6-90. Amplifier U23C, transistors Q5 and Q7, and transistors Q3 and Q4 on the Motor Drive Transistor PCA comprise the Y-servo amplifier. Its operation is similar to that of the X-servo amplifier. A simplified diagram of the motor drive circuitry is shown in Figure 6-7.

6-91. U40D forms a level detector, the inputs of which are connected to the output of both servo amplifiers. Its output feeds DS2 and DS3, whose indications are used in certain tests of the servo circuitry. Positive and negative voltages greater in magnitude than the circuit's threshold (about 8 V) illuminate DS2 and DS3, respectively.

6-92. **REFERENCE SOURCE.** Zener diode VR1 and resistor R46 develop a +5.1 V reference voltage from the +12 V power supply. A voltage divider consisting of R44

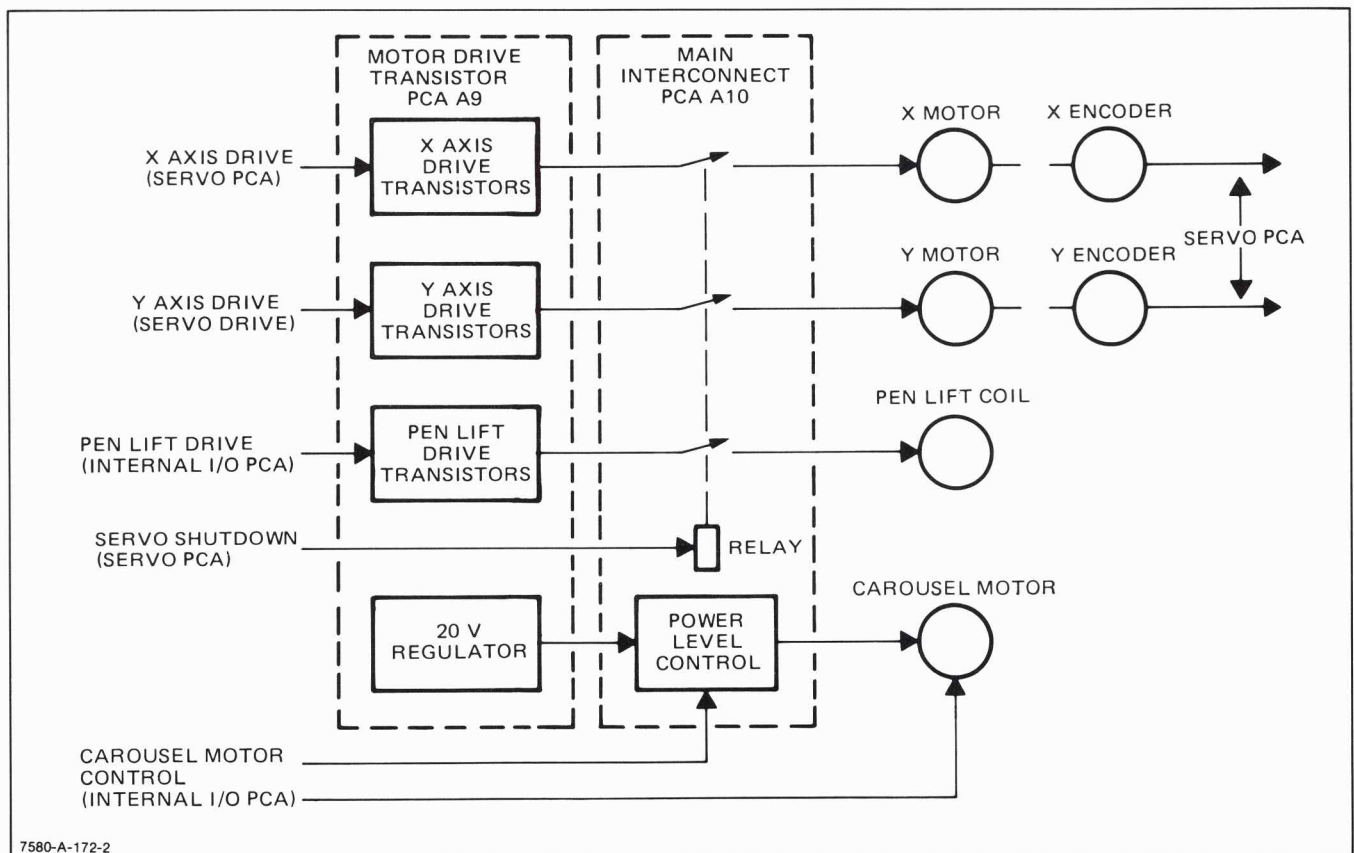


Figure 6-7. Motor Drive Circuits Simplified Block Diagram

and R45 develops a +2.55 V reference from this voltage. Inverting amplifier U40A develops a -5.1 V reference voltage from the +5.1 V source.

6-93. The +2.55 V source is used by the power up and shutdown circuits, while the ± 5.1 V sources establish an accurate reference from which to set the DAC and servo amplifiers' dc offset.

6-94. **SAFETY CIRCUIT.** When power is first applied to the plotter and the power supply outputs are rising to their quiescent levels, Q1 of the motor shutdown relay drive latch is ON and Q2 is OFF. After the ± 12 V supplies reach their working voltage and the 1 MHz clock is available, the output of U1A and U1B is high, preparing Q1 and Q2 to change state. Once the +5 V supply, which is the last supply to reach its working level, achieves a voltage greater than +4.5 V, the PUP (POWER UP) signal at pin 13 of U1D goes to a high level. The processor recognizes the PUP signal and sends a STARTUP signal to the servo through pin 2 of U3. The low going STARTUP pulse turns Q1 OFF and Q2 ON. Q2 energizes relay K1 which completes the circuit from the servo amplifiers to the servo motors. If any of the previously mentioned conditions fail, relay K1 will not be energized and no drive will be available to the motors.

6-95. A failure of the main clock circuit would cause the servo to apply incorrect signals to the servo motors, a condition which could cause damage to the mechanics. Failure of the 1 MHz clock is detected by U18A and Q3. When the clock signal is present, the voltage at the collector of Q3 is close to 0 V. When no clock signal is applied to Q3, its collector goes to a high level which turns Q2 OFF through U1B. Relay K1 then opens and removes the drive from the servo motors.

6-96. Failure of the processor to respond to an interrupt from the Servo PCA would cause signals to be applied to the servo motors which could cause damage to the mechanics. Every interrupt cycle, counter U31 is cleared by the output of U15C. It then counts the $\overline{\text{XECLK}}$ and $\overline{\text{YECLK}}$ position error control signals supplied by U15D. If two control signals are counted, a high level is present at pin 11 of the counter. If one or both of the signals is missing, a low level is input to U8B by the pin 11 output of the counter. This causes the signal ($\overline{\text{SHUTDOWN}}$) at pin 9 of U8B to go to a low level at the end of the interrupt cycle as determined by the 1 kHz clock. Q2 is turned OFF by the $\overline{\text{SHUTDOWN}}$ signal and relay K1 opens, removing the drive from the servo motors.

6-97. If servo shutdown occurs because of a missing clock signal or an interrupt service failure, the servo can only be restarted by correcting the malfunction and cycling power.

6-98. **INTERFACING CIRCUITRY.** Bidirectional bus transceivers U5 and U6 provide the data path to and from the Processor PCA. The direction of communication is controlled by the processor READ/WRITE signal which, through U4, sets the level at pin 1 of these devices accordingly. A low level causes data from the microprocessor bus to be applied to the servo control electronics when pin 19 is low, while a high level puts data from the servo electronics on the microprocessor bus.

6-99. Buffer U4 and decoder U11 provide the servo control signals for reading X- and Y-position ($\overline{\text{X POS RD}}$, $\overline{\text{Y POS RD}}$), writing X- and Y-position error ($\overline{\text{XECLK}}$, $\overline{\text{YECLK}}$), and clocking the X- and Y-endpoint signals and the startup signal (START/END) into U3. The $\overline{\text{LONG DIV}}$ signal at pin 7 of U11 indicates that the processor is involved in a long division calculation at the time an interrupt for reading position is to be received from the servo control electronics.

6-100. When the IOA7 line is pulsed, the X- and Y-position counts are registered into their respective position registers. The $\overline{\text{X POS RD}}$ and $\overline{\text{Y POS RD}}$ signals then make the counts available to the bus by enabling the outputs of these registers.

6-101. To input X- and Y-position error data to the servo control electronics, the processor places the data on the bus and brings pin 1 of U5 and U6 to a low level. The $\overline{\text{XECLK}}$ or $\overline{\text{YECLK}}$ signal then stores the data in the corresponding position error register.

6-102. The control signals, listed in Table 6-1, are developed by U11 from the A1, A2, and A3 lines connecting to U4. Simultaneous low levels on the $\overline{\text{IOA7}}$ and $\overline{\text{IODS}}$ lines applied to U4 enable the outputs of U11. $\overline{\text{IOA7}}$ is low once the position counts have been stored in the position registers and the $\overline{\text{IODS}}$ is low when valid data is present on the A1, A2, and A3 lines.

Table 6-1. Servo Control Signals

CONTROL SIGNAL	A3	A2	A1
$\overline{\text{START/END}}$	1	0	0
$\overline{\text{LONG DIVISION}}$	1	1	1
$\overline{\text{X POS RD}}$	0	1	0
$\overline{\text{XECLK}}$	0	0	0
$\overline{\text{Y POS RD}}$	0	1	1
$\overline{\text{YECLK}}$	0	0	1

6-103. SENSOR INTERCONNECT PCA A8

6-104. The Sensor Interconnect PCA A8, illustrated on Service Sheet 7, provides the internal connections from the various sensors and photo devices to the plotter circuitry.

6-105. Inputs from the pen carriage assembly, carriage cover microswitch, front and rear sensors, paper sensor assembly, and carousel sensor are input through the Main Interconnect PCA to the Internal I/O PCA for interpretation and resultant plotter action.

6-106. SENSOR ASSEMBLIES

6-107. The various sensors and photo devices used in the Model 7580B Plotter are illustrated on Service Sheet 8.

6-108. The Carousel Sensor assembly (A7) is a photo-emissive/photo-receptive device. The photo device emits a beam of light which is reflected back by a reflector strip on the pen carousel assembly. The reflected beam

is detected and the sensor conveys this information through the Sensor Interconnect and Main Interconnect PCAs to the carousel initialization circuitry on the Internal I/O PCA.

6-109. The Front Sensor PCA A11 and the Rear Sensor PCA A12 are used as photo-emissive/photo-receptive pairs for carousel present, pen in carousel, and pen carriage initialization sensing. The beams of light emitted by the photo-emissive diodes on A11 are sensed by the corresponding photo transistors on A12. The broken beams of light indicate the presence of a carousel, if there are pens in the carousel and which stables are occupied, and when the pen carriage is in the initialization position. This information is passed through the Sensor Interconnect and Main Interconnect PCAs to the Internal I/O PCA.

6-110. Two photo devices comprise the Paper Sensor PCA Assembly (A13). The front and rear photo devices are used to sense the front and rear edges of the media loaded onto the plotter. The beam emitted by the photo-emissive diodes is reflected back by the media to the photo transistors. When a media edge passes the photo device, the beam is no longer reflected and thus broken. This method 'senses' the media edges, and the information is input to the Internal I/O PCA for interpretation.

6-111. A two microswitch safety interlock comprised of both the primary and supplementary carriage cover microswitches suspends plotter operation when the carriage cover is raised to the open position. Opening the normally closed primary microswitch causes bus line 7 on the Internal I/O PCA to be pulled high invoking an interrupt signal. Closing the normally open supplementary microswitch causes bus line 3 on the Internal I/O PCA to be pulled high invoking an interrupt signal. The CPU samples the interrupt inputs every cycle and if an active input is found, the subsequent INSTRUCTION FETCH (IF) cycle is aborted and the normal INTERRUPT ACKNOWLEDGE (IAK) cycle started.

6-112. The pen lift photo sensor, located on the pen carriage assembly, consists of a photo-emissive diode and photo transistor. The electronically controlled pen lift system implements two different pen lift heights. The pen is raised only slightly for small moves and is raised to maximum height for long moves. As the pen holder is raised, a tab on the holder mechanism allows more light to pass from the photo diode to the photo transistor. This information is sent to the Internal I/O PCA for interpretation by the pen lift control circuitry.

6-113. The pinch wheel reed switch, located on the pen carriage assembly, is used for sensing media size and setting the right-hand limit of the plotting area during plotter initialization. As the pen carriage traverses the Y-arm assembly, the reed switch passes directly over the moveable pinch wheel. The moveable pinch wheel is to be positioned at the edge of the media. A magnet in the moveable pinch wheel causes the reed switch to energize as it passes over. This information is interpreted by the Internal I/O PCA, which sets the pen lift control circuitry.

6-114. POWER SUPPLY CIRCUITS (PCAs A14, A15)

6-115. The power supply circuitry, illustrated on Service Sheet 9, provides the dc operating voltages to the plotter

circuits. A simplified block diagram of the power supply circuitry is shown in Figure 6-8.

6-116. INPUT VOLTAGE. The ac power source is switched into the primary windings of power transformer T1 through the LINE ON/OFF switch, the appropriate internal line fuse, and the voltage selector switches. Inductors L1 and L2 provide radio frequency interference (RFI) filtering for the ac lines.

6-117. Power transformer T1 provides the proper stepped down voltage to the full wave rectifier diodes CR9-CR12. Radio frequency interference (RFI) filtering is supplied by capacitors C19, C23, and C24.

6-118. ± 30 VOLT UNREGULATED SUPPLIES. The ± 30 V unregulated supplies are provided by full wave rectifier diodes CR9-CR12. The +30 V circuit is filtered by capacitors C15 and C21. Resistor R21 supplies the discharge path for C15, and fuse F2 provides the circuit protection. The -30 V circuit is filtered by C6 and C1. R1 supplies the discharge path for C6, and F1 provides the circuit protection.

6-119. ± 12 VOLT REGULATED SUPPLIES. The +12 V and -12 V supplies are developed by a pair of regulators connected across the unregulated +30 V and -30 V supply lines. Input to the +12 V series regulator U2 is protected by F4 and stabilized from high frequency oscillation by capacitor C11. The input to U2 is forward biased through series pass transistor Q4 referenced by zener diode VR2. Diode CR4 will protect the regulator should a loss of input voltage occur. The +12 V output from U2 is stabilized by capacitor C13. Reverse polarity protection is provided by diode CR5.

6-120. Input to the -12 V regulator U3 is protected by F3 and stabilized from high frequency oscillation by C14. The input to U3 is biased through series pass transistor Q6 referenced by zener diode VR3. Diode CR8 protects the regulator should a loss of input voltage occur. The -12 V output from U3 is stabilized by C20. CR7 provides reverse polarity protection.

6-121. CONTROL CIRCUIT. Switching type circuitry is used to develop a +5 V supply from the unregulated +30 volt line. The +30 V is applied through F5 both to the control circuit U1 and the +5 V switching circuitry.

6-122. The +30 volts is fed through limiting resistor R31 to U1-1 providing the current drive input for the internal stabilized supply. Pin 12 of U1 provides the circuit common to the internal stabilized power supply. The output of the internal supply on pin 2 is a stabilized reference voltage input to pin 6 for the slow-start circuit and duty adjust cycle. R14, R15, and R17 form a pull-up network for the unused inputs to pins 5, 9, and 10. R11 and C9 determine the dead-time and soft-start time for the slow-start circuit.

6-123. Pins 7 and 8 of U1 provide the oscillator set control inputs of the sawtooth generator. R10 determines the constant current that charges the timing capacitor C8.

6-124. The +30 volts is also applied through a voltage divider consisting of R29 and R30 to pin 16 of U1 for feed forward control in the feedback loop which regulates

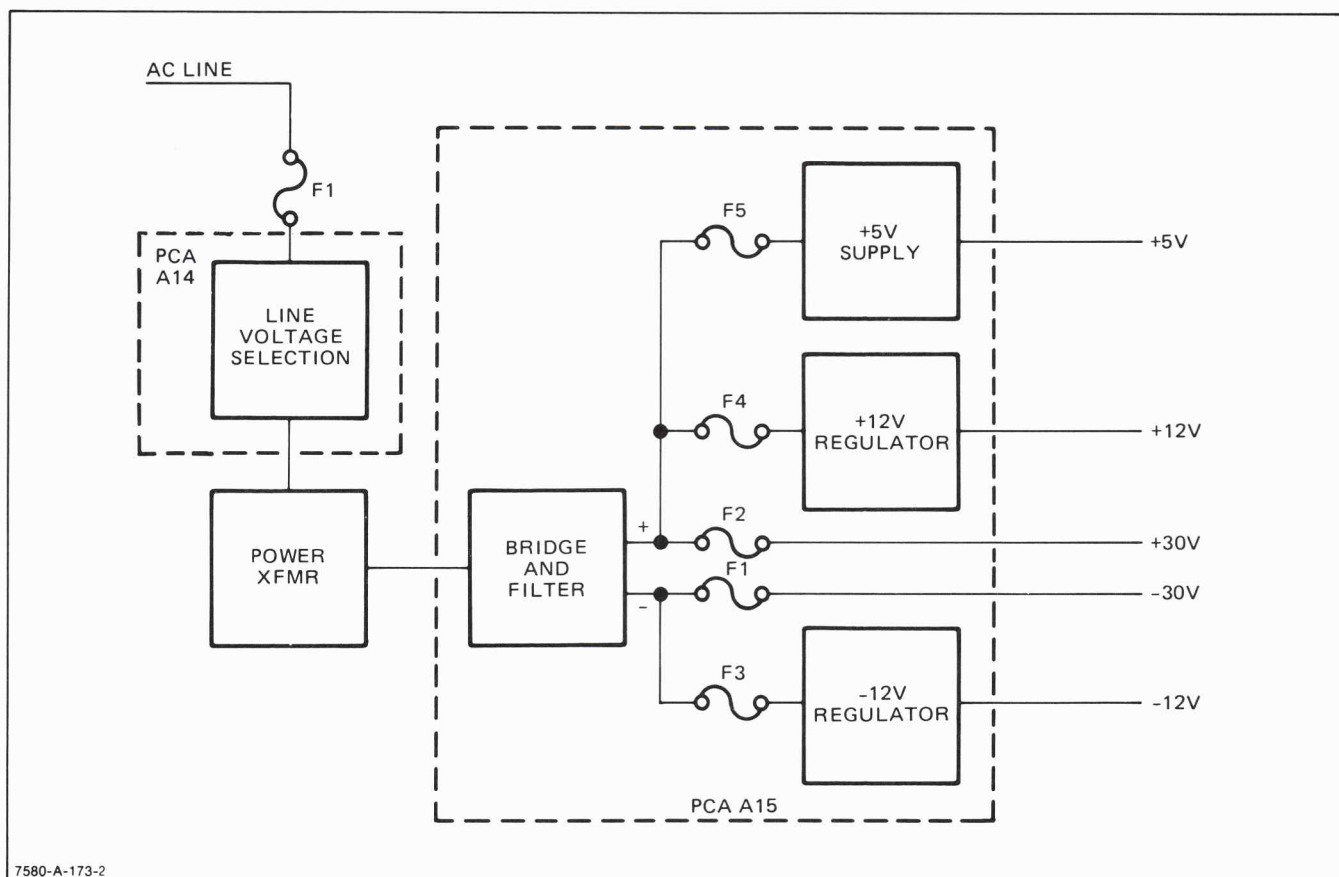


Figure 6-8. Power Supply Circuits Simplified Block Diagram

line variations. The feed forward function increases the charging current for the timing capacitor on pin 8 when the voltage at pin 16 exceeds the stabilized voltage from pin 2.

6-125. The inhibit input at pin 13 and the inverted output pulse at pin 14 are not used and, therefore, connected to circuit common.

6-126. Current sensed from the +5 V switching supply is input to pin 11 of U1 for dynamic current limit and current protection via the internal stop-start circuit. The current limit circuit has two trip-on levels; the lower level for cyclic current limiting, the upper level for current protection by means of the internal switch-off and slow-start circuit.

6-127. Feedback information from the +5 V switching supply is input to the control circuit U1 on pin 3 for the error amplifier. Resistor R18 sets the gain to the pulse width modulator and potentiometer R20 adjusts the +5 V reference voltage. R12, R19, C10, and C12 stabilize the feedback loop for input to the error amplifier.

6-128. The square wave output pulse on pin 15 of the control circuit is input to the bias transistor Q8 in the +5 V switching supply.

6-129. +5 VOLT SWITCHING SUPPLY. Switching type circuitry is used to develop a +5 volt supply from the unregulated +30 V line. The +30 V is applied through R27 to the collector of Q8 and through R28 to the base of Q8 for biasing. When the square wave output of U1-15

goes low, Q8 is reverse biased turning ON the Darlington pair Q10 and Q9 which in turn allow a charge to be built up on C17 to aid in turning ON the series pass transistor Q5. The +30 V is also fed through a filter network comprised of L4, L5, C16, and C22 to the emitter of Q5. During the time Q5 is conducting, a ramp of current is developed in inductor L1 which charges capacitor C2 to the output voltage of +5 volts.

6-130. During the time the square wave output of U1-15 goes high, Q8 is forward biased turning OFF the Darlington pair Q10 and Q9. With Q10 and Q9 turned OFF, the charge on C17 discharges through R25 and CR6 turning ON Q7 and reverse biasing Q5. When Q5 is turned OFF, the current built up in L1 by the ramp current function will continue to flow through diode CR2, but with decreasing magnitude. Consequently, the charge on capacitor C2 starts to discharge and the +5 V output starts to drop. The +5 V charge on C2 is fed back to the error amp in the control circuit U1 and to the +5 V overload protection circuit. The sensing circuit 'senses' the current through T1 and inputs the sensed current to pin 11 of U1 for the current limit and protection circuitry. The current sensing circuit is comprised of T1, R7, R8, R9, C7, and CR3.

6-131. +5 V OVER-VOLTAGE PROTECTION CIRCUIT. A +5 V over-voltage protection circuit provides protection to the load should an over-voltage condition occur. If the +5 V output voltage exceeds the reference voltage set by VR1, current starts conducting through VR1 thereby turning Q1 ON. When Q1 conducts, Q2 turns ON, building up a charge on C5 to trigger SCR Q3.

When SCR Q3 conducts, it clamps the +5 V output to common protecting the load. The time constant of R6 and C5 prevent shutdown due to spurious excursions. Diode CR1 provides reverse polarity protection for the protection circuit and L2, L3, C3, and C4 provide additional filtering for the switching supply.

6-132. TROUBLESHOOTING

6-133. The self-test feature of the plotter (see Section II) can be used as an aid in isolating a failure to a defective assembly or component. The service sheets in this section can also be used to help isolate failures on the printed circuit assemblies (PCAs).

6-134. During the initialization sequence, when the plotter is first powered up, a basic internal diagnostic check of the plotter electronics is performed. If a malfunction is detected, the initialization sequence will stop and an

error code will be displayed, in hexadecimal, in the alphanumeric (A/N) display on the front panel. The error codes, error messages, and probable locations of the malfunctions are listed in Table 6-2.

6-135. Steps for isolating malfunctions indicated by error codes E27 and E28 are provided in Table 6-3. Refer to the appropriate error code and follow the given procedures.

6-136. RECOMMENDED TEST EQUIPMENT AND TOOLS

6-137. Test equipment required to maintain the plotter is listed in the Recommended Test Equipment table in Section I of this manual and in Table 6-4. Substitute equipment must meet or exceed the specifications of the equipment recommended.

Table 6-2. Error Codes and Messages

ERROR CODE	ERROR MESSAGE	PROBABLE LOCATION
E01	Random Access Memory (RAM) error	Processor PCA A3
E02	Read Only Memory (ROM) checksum error	Processor PCA A3
E03	Arithmetic overflow in line clipper	Processor PCA A3
E04	Floating point underflow	Processor PCA A3
E05	Floating point overflow	Processor PCA A3
E06	EAROM checksum error	Internal I/O PCA A5
E21	Pen initialization sensor failure	Sensor or Internal I/O PCA
E22	Front Paper Sensor failure or paper has dropped out of plotter	Front Paper Sensor, Sensor Interconnect PCA, Internal I/O PCA, or black material on pen cover missing
E23	Rear Paper Sensor failure or paper has dropped out of plotter	Rear Paper Sensor or Internal I/O PCA
E24	Pinch wheel motor rotation not confirmed	Microswitch, pinch wheel motor, mechanics, or Internal I/O PCA
E25	Excessive velocity in X-axis	X-motor encoder or X- and Y-Axis Servo PCA A6
E26	Excessive velocity in Y-axis	Y-motor encoder or X- and Y-Axis Servo PCA A6
E27	Excessive error in X-axis Refer to Table 6-3 for isolation of error code E27 malfunctions	X-motor, X- and Y-Axis Servo PCA A6, Main Interconnect PCA A10 amplifier, X-motor encoder or mechanics, Motor Drive Transistor PCA A9, Power Supply PCA A15, Internal I/O PCA A5, or Pen Carriage Assembly
E28	Excessive error in Y-axis Refer to Table 6-3 for isolation of error code E28 malfunctions	Y-motor, X- and Y-Axis Servo PCA A6, Main Interconnect PCA A10 amplifier, Y-motor encoder or mechanics, Motor Drive Transistor PCA A9, Power Supply PCA A15, Internal I/O PCA A5, or Pen Carriage Assembly
E30	Primary or supplementary carriage cover interlock microswitch failure	Interlock safety microswitch inoperative

Table 6-2. Error Codes and Messages (Continued)

ERROR CODE	ERROR MESSAGE	PROBABLE LOCATION
E31	Reed switch broken or pinch wheel improperly positioned	Reed switch, pen lift cable, right-hand pinch wheel magnet, or Internal I/O PCA A5
E32	Pen pick attempted with pen already in pen holder	Pen carousel mechanics, carousel sensors, or Internal I/O PCA A5
E33	Pen pick attempted with no pen present	Pen carousel sensors, pen present sensor, or Internal I/O PCA A5
E34	Pen pick not successful	Pen carousel sensors, carousel mechanics, or Internal I/O PCA A5
E35	Pen return attempted with pen already present in the stable	Carousel sensors, pen present sensor, carousel mechanics, or Internal I/O PCA A5
E36	Pen return attempted with no pen in the pen holder	Carousel sensors or mechanics, pen holder mechanics, or Internal I/O PCA A5
E37	Pen return not successful	Carousel sensors or mechanics, pen holder mechanics, or Internal I/O PCA A5
E38	System failure	Processor PCA A3

Table 6-3. Error Codes E27 and E28 Malfunctions

ERROR CODE	MALFUNCTION ISOLATION PROCEDURE	PROBABLE LOCATION
E27	<p>When any of the following conditions occur, Servo relay K1 on the Main Interconnect PCA A10 will de-energize interrupting drive to the X-axis drive motor and the pen lift coil, generating an error code of E27.</p> <ul style="list-style-type: none"> A. Processor does not respond to an interrupt signal from the Servo PCA caused by either a defective processor or detection of excessive position error in the X-axis. B. Excessive current flow in the pen lift coil. C. Clock circuit failure. D. Power supply voltage lost. <p>The following steps are given to aid in isolating the defect generating the error code.</p> <ol style="list-style-type: none"> 1. Turn the plotter OFF and raise the carriage cover. Turn the plotter ON. Wait one minute and then, using moderate effort, attempt to rotate the grit wheel in both directions. If the grit wheel does not turn, proceed to step 10. If the grit wheel turns (no torque supplied by X-motor), proceed to step 2. 2. Turn the plotter OFF. Disconnect the pen carriage trailing cable from J1 on the sensor Interconnect PCA. Raise the carriage cover and turn the plotter ON. Using moderate effort, attempt to rotate the grit wheel in both directions. Reconnect trailing cable when completed. If the grit wheel does not turn, perform the pen lift adjustments procedure. If the grit wheel turns (no torque supplied by the X-motor), proceed to step 3. 	Pen Carriage Assembly

Table 6-3. Error Codes E27 and E28 Malfunctions (Continued)

ERROR CODE	MALFUNCTION ISOLATION PROCEDURE	PROBABLE LOCATION
E27 (cont'd)	3. Check the ± 30 V, ± 12 V, and +5 V power supply voltages. If the voltages are present, proceed to step 4. If the voltages are not present, troubleshoot the power supply.	Power Supply PCA A15
	4. Turn the plotter OFF and raise the carriage cover. Turn the plotter ON. Observe DS1 on the Servo PCA. If DS1 is lit, proceed to step 5. If DS1 is not lit, troubleshoot the servo shutdown circuitry of the Servo PCA or replace the Servo PCA.	X- and Y-Axis Servo PCA
	5. Set the SWX and SWY switches on the Servo PCA to the OFF position. Set the SWT switch on the Servo PCA to the TEST position. Invoke self-test 12. DS2 and DS3 on the Servo PCA should alternately flash ON and OFF. If the lamps flash, proceed to step 6. If the lamps do not flash, troubleshoot the X-servo amplifier circuitry on the Servo PCA or replace the Servo PCA.	X- and Y-Axis Servo PCA
	6. Set the SWX switch on the Servo PCA to the ON position. Set the SWY switch on the Servo PCA to the OFF position and the SWT switch to the TEST position. DS2 and DS3 on the Servo PCA should alternately flash ON and OFF, but brighter than in step 5. If the brilliance of DS2 and DS3 increases over that of step 5, proceed to step 7. If the brilliance of DS2 and/or DS3 does not increase, replace transistors Q1 and Q2 on the Motor Drive Transistor PCA.	Motor Drive Transistor PCA
	7. Set the SWT switch on the Servo PCA to the TEST position. Invoke self-test 14. Manually rotate the grit wheel rapidly in one direction and then in the opposite direction. DS2 and DS3 on the Servo PCA should alternately flash ON and OFF as the grit wheel is rotated. Upon completion of this step, set the SWT switch to the NORMAL position and the SWX and SWY switches to the ON position. If DS2 and DS3 flash, proceed to step 8. If the lamps do not flash, proceed to step 9.	
	8. Check the operation and continuity of relay K1 on the Main Interconnect PCA. The relay should be energized when DS1 on the Servo PCA is lit and de-energized when DS1 is not lit. If the relay does not energize, troubleshoot the relay and transistor Q2 on the Servo PCA. If the relay is operational, check the X-motor/encoder assembly and replace if questionable.	Main Interconnect PCA or X- and Y-Axis Servo PCA or X-motor/encoder assembly
	9. Turn the plotter OFF. Disconnect the X- and Y-motor/encoder cables from the motor/encoder assemblies. Connect the X-encoder cable to the Y-encoder. Set the SWT switch on the Servo PCA to the TEST position. Select self-test 14 and turn the	X-motor/encoder assembly or X- and Y-Axis Servo PCA

Table 6-3. Error Codes E27 and E28 Malfunctions (Continued)

ERROR CODE	MALFUNCTION ISOLATION PROCEDURE	PROBABLE LOCATION
E27 (cont'd)	<p>plotter ON. Manually move the pen carriage across the plotter in both directions. DS2 and DS3 on the Servo PCA should alternately flash ON and OFF as the pen carriage is moved. Upon completion of this step, turn the plotter OFF and reconnect the X- and Y-motor/encoder cables to the respective X- and Y-motor/encoder assemblies. If DS2 and DS3 flash, replace the X-motor/encoder assembly. If DS2 and/or DS3 do not flash, troubleshoot the velocity feedback circuitry on the Servo PCA or replace the Servo PCA.</p> <p>10. Load paper into the plotter and invoke the plotter into the VIEW state. Disconnect the pen carriage trailing cable from J1 on the Sensor Interconnect PCA. Invoke the plotter into the REMOTE state and initiate a plot. Upon completion of plot, reconnect the trailing cable. If the plot runs to completion without generating an E27 error code, perform the pen lift adjustment procedure. If an error code of E27 is generated, proceed to step 3 of this troubleshooting procedure.</p>	Pen Carriage Assembly
E28	<p>Excessive error in Y-axis</p> <p>When any of the following conditions occur, Servo relay K1 on the Main Interconnect PCA A10 will de-energize interrupting drive to the Y-axis drive motor and the pen lift coil, generating an error code of E28.</p> <p>A. Processor does not respond to an interrupt signal from the Servo PCA caused by either a defective processor or detection of excessive position error in the Y-axis.</p> <p>B. Excessive current flow in the pen lift coil.</p> <p>C. Clock circuit failure.</p> <p>D. Power Supply voltages lost.</p> <p>The following steps are given to aid in isolating the defect generating the error code.</p> <p>1. Turn the plotter OFF and raise the carriage cover. Turn the plotter ON. Wait one minute and then, using moderate effort, attempt to move the pen carriage in both directions. If the pen carriage does not move, proceed to step 10. If the pen carriage moves (no torque supplied by the Y-motor), proceed to step 2.</p> <p>2. Turn the plotter OFF. Disconnect the pen carriage trailing cable from J1 on the Sensor Interconnect PCA. Raise the carriage cover and turn the plotter ON. Using moderate effort, attempt to move the pen carriage in both directions. Reconnect trailing cable when completed. If the pen carriage does not move, perform the pen lift adjustment procedure. If the pen carriage moves (no torque supplied by the Y-motor), proceed to step 3.</p>	<p>Y-motor, X- and Y-Axis Servo PCA A6, Main Interconnect PCA A10 amplifier, Y-motor/encoder or mechanics, Motor Drive Transistor PCA A9, Power Supply PCA A15, Internal I/O PCA A5, or Pen Carriage Assembly</p> <p>Pen Carriage Assembly</p>

Table 6-3. Error Codes E27 and E28 Malfunctions (Continued)

ERROR CODE	MALFUNCTION ISOLATION PROCEDURE	PROBABLE LOCATION
E28 (cont'd)	3. Check the ± 30 V, ± 12 V, and +5 V power supply voltages. If the voltages are present, proceed to step 4. If the voltages are not present, troubleshoot the power supply.	Power Supply PCA A15
	4. Turn the plotter OFF and raise the carriage cover. Turn the plotter ON. Observe DS1 on the Servo PCA. If DS1 is lit, proceed to step 5. If DS1 is not lit, troubleshoot the servo shutdown circuitry of the Servo PCA or replace the Servo PCA.	X- and Y-Axis Servo PCA
	5. Set the SWX and SWY switches on the Servo PCA to the OFF position. Set the SWT switch on the Servo PCA to the TEST position. Invoke self-test 13. DS2 and DS3 on the Servo PCA should alternately flash ON and OFF. If the lamps flash, proceed to step 6. If the lamps do not flash, troubleshoot the Y-servo amplifier circuitry on the Servo PCA or replace the Servo PCA.	X- and Y-Axis Servo PCA
	6. Set the SWY switch on the Servo PCA to the ON position. Set the SWX switch on the Servo PCA to the OFF position and the SWT switch to the TEST position. DS2 and DS3 on the Servo PCA should alternately flash ON and OFF, but brighter than in step 5. If the brilliance of DS2 and DS3 increases over that of step 5, proceed to step 7. If the brilliance of DS2 and/or DS3 does not increase, replace transistors Q3 and Q4 on the Motor Drive Transistor PCA.	Motor Drive Transistor PCA
	7. Set the SWT switch on the Servo PCA to the TEST position. Invoke self-test 15. Manually move the pen carriage rapidly in one direction and then in the opposite direction. DS2 and DS3 on the Servo PCA should alternately flash ON and OFF as the pen carriage is moved. Upon completion of this step, set the SWT switch to the NORMAL position and the SWX and SWY switches to the ON position. If DS2 and DS3 flash, proceed to step 8. If the lamps do not flash, proceed to step 9.	
	8. Check the operation and continuity of relay K1 on the Main Interconnect PCA. The relay should be energized when DS1 on the Servo PCA is lit and de-energized when DS1 is not lit. If the relay does not energize, troubleshoot the relay and transistor Q2 on the Servo PCA. If the relay is operational, check the Y-motor/encoder assembly and replace if questionable.	Main Interconnect PCA or X- and Y-Axis Servo PCA or Y-motor/encoder assembly
	9. Turn the plotter OFF. Disconnect the X- and Y-motor/encoder cables from the motor/encoder assemblies. Connect the Y-encoder cable to the X-encoder. Set the SWT switch on the Servo PCA to the TEST position. Select self-test 15 and turn the plotter ON. Manually rotate the grit wheel rapidly	Y-motor/encoder assembly or X- and Y-Axis Servo PCA

Table 6-3. Error Codes E27 and E28 Malfunctions (Continued)

ERROR CODE	MALFUNCTION ISOLATION PROCEDURE	PROBABLE LOCATION
E28 (cont'd)	<p>in both directions. DS2 and DS3 on the Servo PCA should alternately flash ON and OFF as the grit wheel is rotated. Upon completion of this step, turn the plotter OFF and reconnect the X- and Y-motor/encoder cables to the respective X- and Y-motor/encoder assemblies. If DS2 and DS3 flash, replace the Y-motor/encoder assembly. If DS2 and/or DS3 do not flash, troubleshoot the velocity feedback circuitry on the Servo PCA or replace the Servo PCA.</p> <p>10. Load paper into the plotter and invoke the plotter into the VIEW state. Disconnect the pen carriage trailing cable from J1 on the Sensor Interconnect PCA. Invoke the plotter into the REMOTE state and initiate a plot. Upon completion of plot, reconnect the trailing cable. If the plot runs to completion without generating an E28 error code, perform the pen lift adjustment procedure. If an error code of E28 is generated, proceed to step 3 of this troubleshooting procedure.</p>	Pen Carriage Assembly

Table 6-4. Recommended Test Equipment and Tools

INSTRUMENT TYPE	SUGGESTED MODEL
Voltmeter	HP 427A or equivalent
Digital Multimeter	HP 3435A or equivalent
Oscilloscope	HP 182C or equivalent
Vertical Plug-in; Dual Channel Amplifier	HP 1801A
Time Base Plug-in; 10 ns to 1 s	HP 1820C
Logic Probe	HP 10525T
Logic Pulser	HP 10526T
Expense Support Package	07580-67801
Inventory Support Package (Exchange PCAs not included)	07580-67901
Digitizing Sight	09872-60066
Tension Gauge (0-700 gm)	8750-0324
Optical Comparator	Bausch and Lomb measuring magnifier No. 81-34-35
Pen Lift Adjustment Tool	07580-60205
Fork Alignment Fixture	07580-60207
Carousel Alignment Fixture	07580-60208
Y-Arm Height Alignment Tool	07585-60300
Y-Arm Parallelism Alignment Tool	07585-60301
HP 85 Service System	N/A
EAROM Reprogramming Tape	5010-2503

6-138. CLEANING

6-139. Thorough cleaning should be performed periodically. Cleaning intervals are determined by the type of operation, local air contamination, and climatic conditions. Cleaning procedures should include the following:

WARNING

Disconnect the plotter from the power source prior to performing any maintenance. DO NOT allow water to run onto electrical components and circuits or through openings in the enclosure as it may create a shock hazard.

- a. Blow away dust accumulation with compressed air if available.
- b. Clean the outer surface of the plotter with a damp sponge or cloth. Use a mild soap and water solution if necessary. Wipe dry after cleaning.
- c. Wipe accumulated paper dust from the rubber pinch wheels. Do not use the grit wheel brush to clean the pinch wheels.

NOTE

Do not use abrasive cleansers on the plastic carriage cover. The cover should be cleaned with a mild solution of soap and water and wiped dry with a soft, lint-free cloth to prevent scratching.

6-140. GRIT WHEEL CLEANING

6-141. Use only the brush provided with your plotter to clean the grit wheel. Cleaning the micro-grip drive grit wheel is limited to the removal of dust from between the particles of grit to ensure that media engagement is not impaired. Dust is removed as follows:

- a. Disconnect power from the plotter.
- b. Raise the carriage cover to gain access to the grit wheel.

CAUTION

Using any brush other than the one supplied with the plotter may damage the grit on the grit wheel.

- c. Manually rotate the grit wheel and brush dust from grit surface using the brush supplied with the plotter.

6-142. PAPER SENSOR CLEANING

6-143. The front and rear paper sensors should be cleaned periodically and whenever the plotter fails to sense and drops paper. Use a dry cotton swab. It is necessary to bend the swab to clean the rear sensor.

- a. Move the pen holder to the far right using the joystick.

- b. Raise the cover to gain access to the sensors.
- c. Wipe the sensors using the cotton swab.

6-144. REPAIR

6-145. The following procedures are given to facilitate repairs and parts replacement for various plotter mechanisms and assemblies.

WARNING

The following service procedures should be performed only by service-trained personnel who are aware of the electrical shock hazards involved.

Certain adjustments described in this section are performed with power applied to the plotter with protective covers removed. Voltage available at many points can, if contacted, result in personal injury.

Any adjustment, maintenance, or repair of the opened plotter with voltage applied should be carried out only by a skilled person who is aware of the hazard involved.

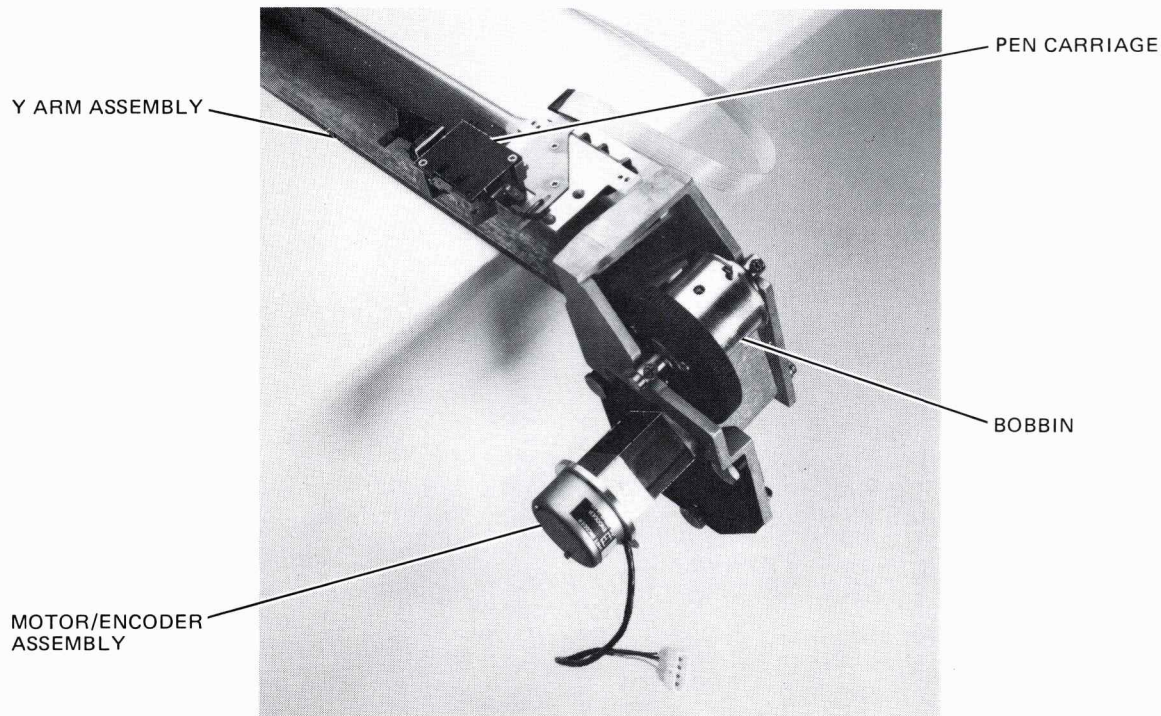
WARNING

Avoid personal contact with moving media. Long hair or ties and other clothing can get caught on the surface of the media and become entangled in the plotter mechanics resulting in personal injury. Lacerations can also occur due to contact with the edges of the moving media.

6-146. Y-DRIVE CABLE REPLACEMENT

6-147. The Y-drive cable stringing diagram is shown in Figure 6-9, Detail B. To string the Y-drive cable, proceed as follows:

- a. Remove the Y-arm assembly from the plotter and position it with the bobbin to the right facing you. To prevent damaging the motor/encoder assembly, set the Y-arm assembly on a flat surface with the right end projecting off the edge of the surface. See Figure 6-9, Detail A.
- b. Tape the pen carriage to the Y-arm at the right-hand end of the Y-arm. This will prevent pen carriage movement and simplify restringing.
- c. Remove the bobbin assembly from the Y-arm. With the sprocket toward you, place the center crimp of the Y-drive cable in the hole located at the center of the bobbin. The short length of cable (as measured from the center crimp) should be to your left-hand side and the longer length of cable to your right-hand side.



DETAIL A

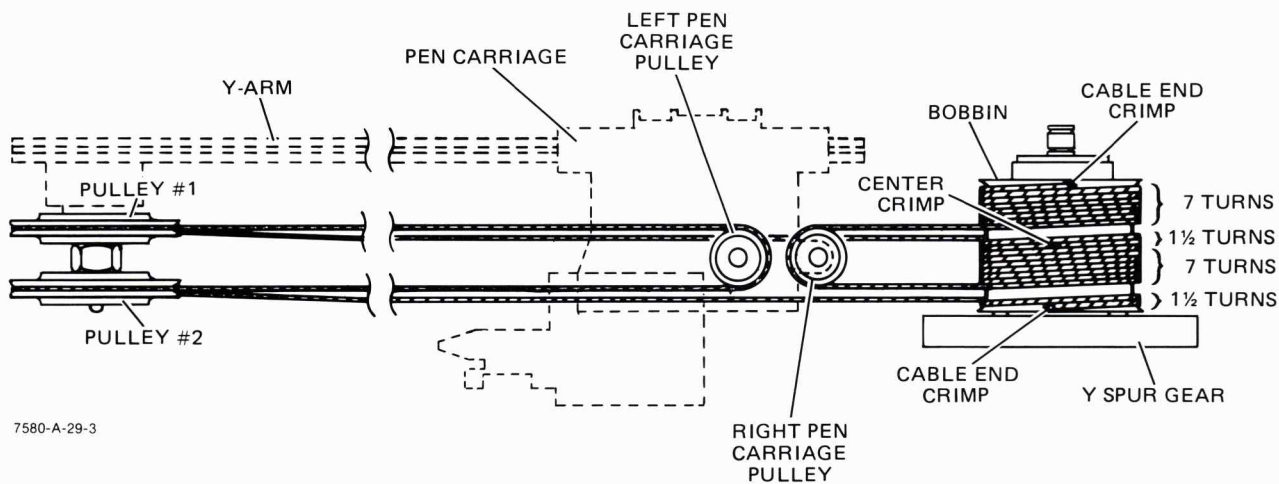


Figure 6-9. Y-Drive Cable Stringing Diagram

- d. Using the short length, wind seven (7) turns from the center crimp toward the Y-spur gear end of the bobbin. Tape cable to prevent unwinding.
- e. Using the long length, wind one and one-half (1-1/2) turns from the center crimp toward the end of the bobbin opposite the Y-spur gear end. Tape cable to prevent unwinding.
- f. Install the bobbin on the Y-arm.
- g. String the long length of the Y-drive cable one-half (1/2) turn around pulley #1 at the left of the Y-arm then back to the left pen carriage pulley.
- h. String the long length of the Y-drive cable one-half (1/2) turn around the left pen carriage pulley then back to pulley #2 at the left end of the Y-arm.
- i. String the long length of the Y-drive cable one-half (1/2) turn around pulley #2 then back to the bobbin.
- j. Wind one and one-half (1-1/2) turns of the long length around the end of the bobbin next to the Y-spur gear (passing the cable behind the bobbin first) and insert the cable end crimp into the hole in the bobbin next to the Y-spur gear.
- k. String the short length of the Y-drive cable one-half (1/2) turn around the right pen carriage pulley then back to the bobbin.
- l. Wind seven (7) turns of the short length around the bobbin toward the end opposite the Y-spur gear (passing the cable in front of the bobbin) and insert the cable end crimp in the hole in the bobbin.
- m. Install the Y-arm assembly into the plotter and perform the cable tension adjustment described in Section III of this manual.
- n. Remove the two screws securing the pen carriage to the drive cable bracket as shown in Figure 6-10, Detail A.
- o. As shown in Figure 6-10, Detail B, compress the two pinch roller springs which apply pressure to the two bearing pivots on top of the carriage. Rotate the carriage forward slightly and remove it from the Y-arm.
- p. To install the pen carriage assembly, perform steps l. through u.
- q. Install the pen carriage on the left end of the Y-arm without the two compression springs mentioned in step j.
- r. Carefully slide a compression spring into place under each bearing pivot until it snaps into its recesses in the carriage and bearing pivots.
- s. Align the pen carriage with the drive cable bracket and install the two mounting screws as shown in Figure 6-10, Detail A.
- t. Manually move the pen carriage to its right-hand limit of travel. Carefully insert the trailing cable in the two clamps on the trailing cable channel. Enough slack should be left between the right-hand clamp and the carriage to allow free movement of the cable without binding.
- u. Insert the free end of the trailing cable into its receptacle on the Sensor Interconnect PCA.
- v. If a new pen carriage has been installed, perform the pen lift adjustment and check Y-arm height adjustment and stable cup fork adjustment per Section III of this manual.
- w. Install the pen carriage cover.
- x. Install the carriage cover, being careful that the cover does not catch the delicate flex circuit protruding from the top of the pen carriage.
- y. Install the pen carousel cover.
- z. Install front-panel cover.

6-148. PEN CARRIAGE REPLACEMENT

6-149. To replace the pen carriage, perform the following procedure:

- a. Turn the plotter OFF.
- b. Remove the front-panel cover assembly.
- c. Remove the pen carousel cover assembly.
- d. Remove the carriage cover.
- e. Manually move the pen carriage toward the left end of the Y-arm until it is positioned in front of the cutout in the trailing cable channel.
- f. Disconnect the trailing cable from the Sensor Interconnect PCA.
- g. Carefully remove the trailing cable from the two clamps securing it to the trailing cable channel.
- h. Remove the two screws securing the plastic cover to the pen carriage and remove the cover.

6-150. X-DRIVE MOTOR/ENCODER REPLACEMENT

6-151. Use the following procedure for replacement of the X-drive motor/encoder assembly.

NOTE

The motor/encoder assembly is serviced as a unit. Do not remove the encoder cover or separate the encoder from the motor.

- a. Turn the plotter OFF.
- b. Remove the front-panel cover assembly and the gear cover to access the X-drive motor.

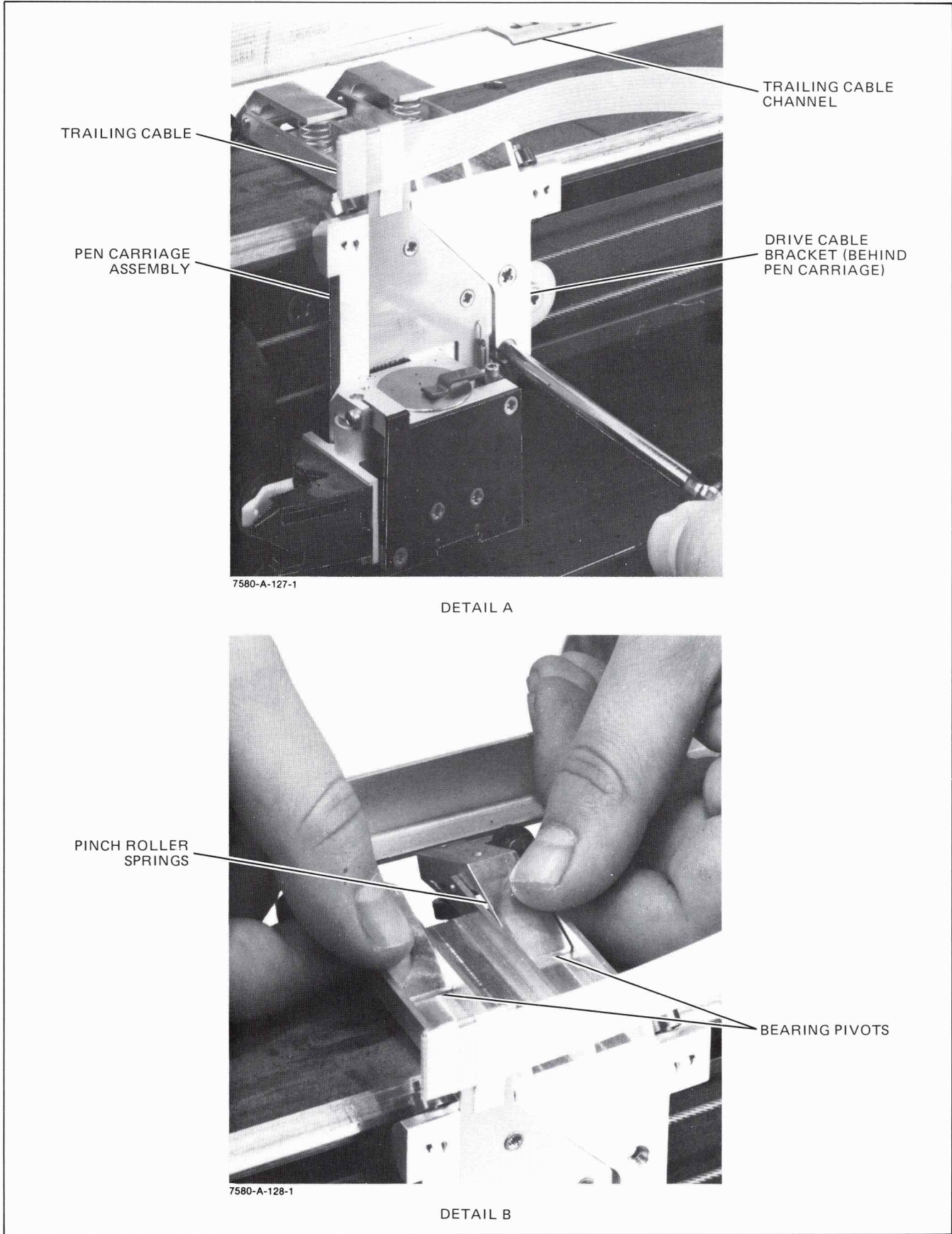


Figure 6-10. Pen Carriage Replacement

- c. Disconnect the X-motor and encoder wires at their plugs.
 - d. Loosen the X-motor backlash locking screw. See Figure 6-11.
 - e. Back off the X-motor backlash adjusting screw several turns.
 - f. Remove the three X-motor plate mounting screws. The X-motor mount can now be removed from the plotter. Retain the three spacers and their wavy washers for reassembly.
 - g. Remove the X-motor/encoder assembly from the motor mount by removing the two mounting screws.
 - h. Install the motor/encoder assembly by performing steps i. through n.
 - i. Install the X-motor/encoder assembly on the X-motor mount with its two mounting screws. Refer to Figure 6-11 for correct orientation of the motor on the mount.
 - j. Install the X-motor mount to the right side plate with the three screws removed in step f. There should be two wavy washers between each of the three spacers and the X-motor mount.
 - k. Adjust the X-motor backlash per Section III of this manual.
 - l. Tighten the X-motor backlash locking screw.
 - m. Connect the X-motor and encoder wires to their appropriate leads from the Main Interconnect PCA.
 - n. Install the gear cover and front-panel cover assembly.
- 6-152. X-SPUR GEAR REPLACEMENT
- 6-153. To replace the X-spur gear, perform the following steps:
- a. Remove the X-drive motor/encoder assembly with mounting plate.
 - b. Loosen the half-inch (1/2 in.) nut on the clamp securing the X-spur gear to the grit wheel shaft. See Figure 6-12, Detail A. Slide the spur gear and clamp assembly off the grit wheel shaft.
 - c. Remove the three screws securing the X-spur gear to the clamp.
 - d. To install the X-spur gear, perform steps e. through m.
 - e. Place the X-spur gear clamp on the grit wheel shaft in the reverse position as shown in Figure 6-12, Detail B.
 - f. Place the X-spur gear on the grit wheel shaft and secure to clamp with the three screws as shown in Figure 6-12, Detail C. Steps e. and f. insure the spur gear is properly centered on the shaft.

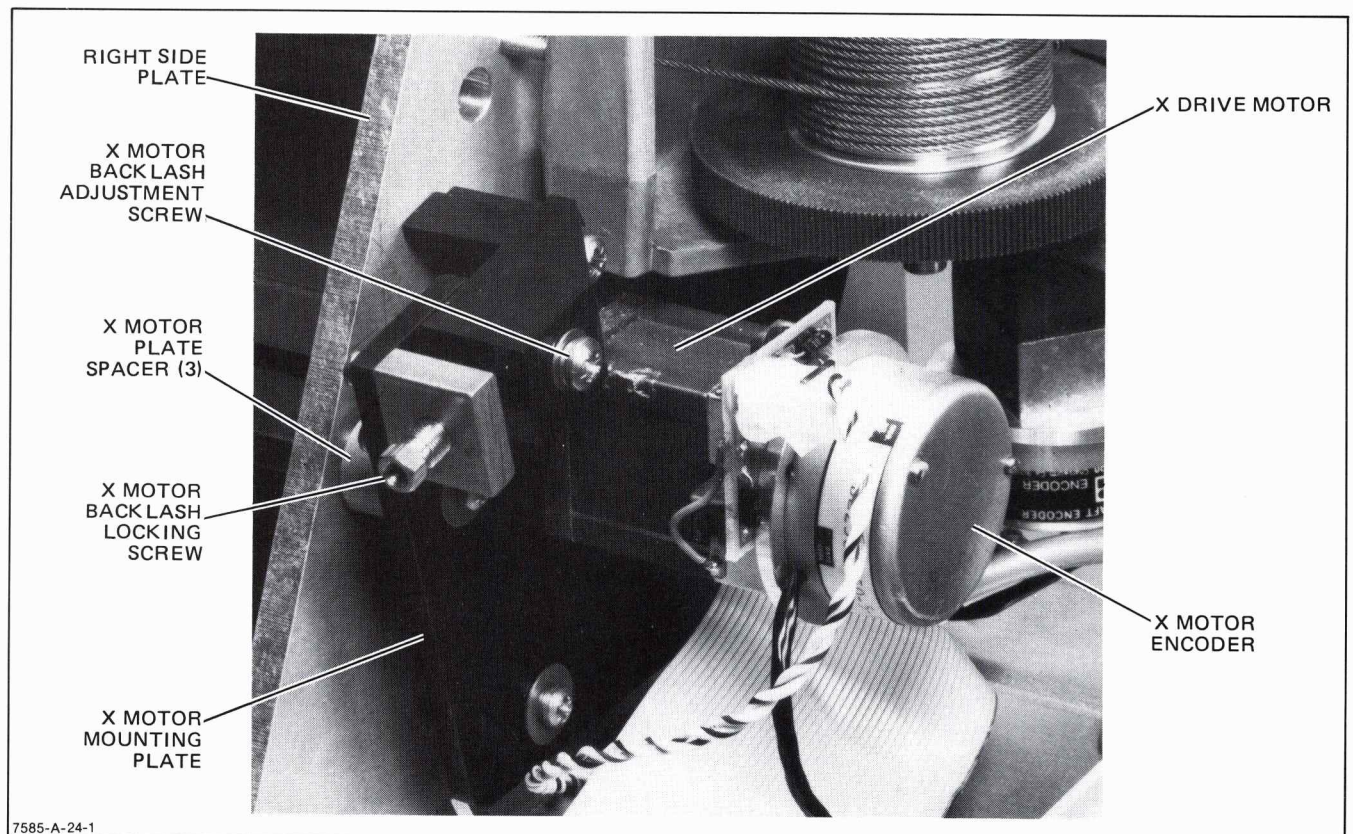


Figure 6-11. X-Drive Motor/Encoder Replacement

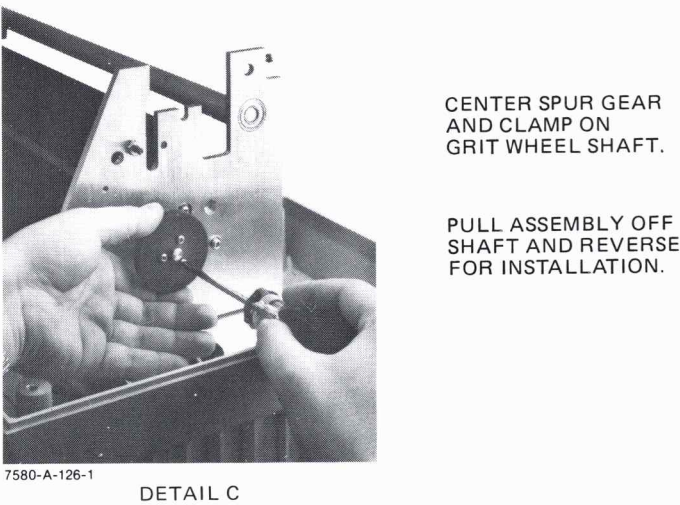
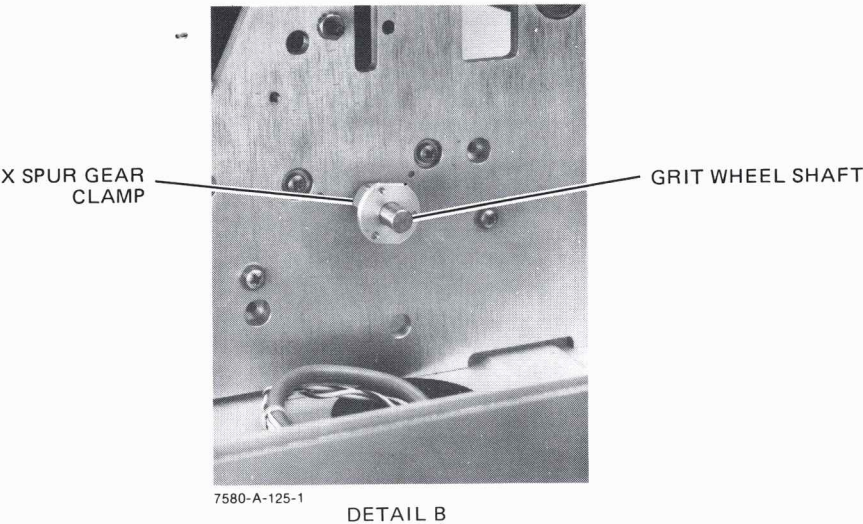
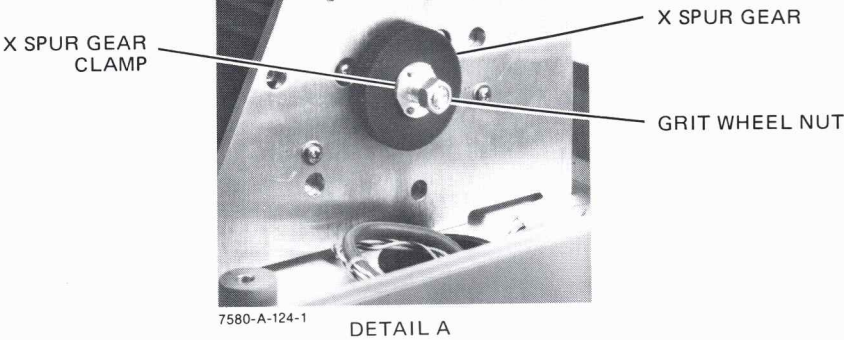


Figure 6-12. X-Spur Gear Replacement

- g. Remove the spur gear and clamp assembly from the grit wheel shaft and install in normal direction as shown in Figure 6-12, Detail A.
 - h. Install the X-drive motor/encoder assembly with mounting plate.
 - i. Move the spur gear/clamp assembly along the grit wheel shaft until the teeth of the spur gear are centered on the motor gear. Tighten the one-half inch (1/2 in.) nut on the spur gear clamp, holding the spur gear to keep it from moving.
 - j. Adjust the X-motor backlash per Section III of this manual.
 - k. Tighten the X-motor backlash locking screw.
 - l. Connect the X-motor/encoder wires.
 - m. Install the front-panel cover assembly.
- 6-154. Y-DRIVE MOTOR/ENCODER REPLACEMENT
- 6-155. Replacement of the Y-drive motor/encoder assembly is accomplished by performing the following steps:

NOTE

The motor/encoder assembly is serviced as a unit. Do not remove the encoder cover or separate the encoder from the motor.

- a. Turn the plotter OFF.

- b. Remove the front-panel cover assembly and the gear cover to access the Y-drive motor.
- c. Disconnect the Y-motor and encoder leads at their plugs.
- d. Loosen the Y-motor backlash locking screw. See Figure 6-13.
- e. Turn the Y-motor backlash adjustment screw several turns counterclockwise.
- f. Remove the Y-motor/encoder assembly by removing the two screws securing it to the Y-arm assembly. The rear screw is accessible as shown in Figure 6-13.
- g. To install the Y-drive motor/encoder assembly, perform steps h. through l.
- h. Install the Y-motor/encoder assembly on the Y-arm assembly with its two mounting screws. Orient the assembly with the motor wires exiting the motor toward the front of the plotter.
- i. Perform Y-motor backlash adjustment per Section III of this manual.
- j. Tighten the Y-motor backlash locking screw.
- k. Connect the Y-motor and encoder wires to their respective leads coming from the Main Interconnect PCA.
- l. Install the gear cover and front-panel cover assembly.

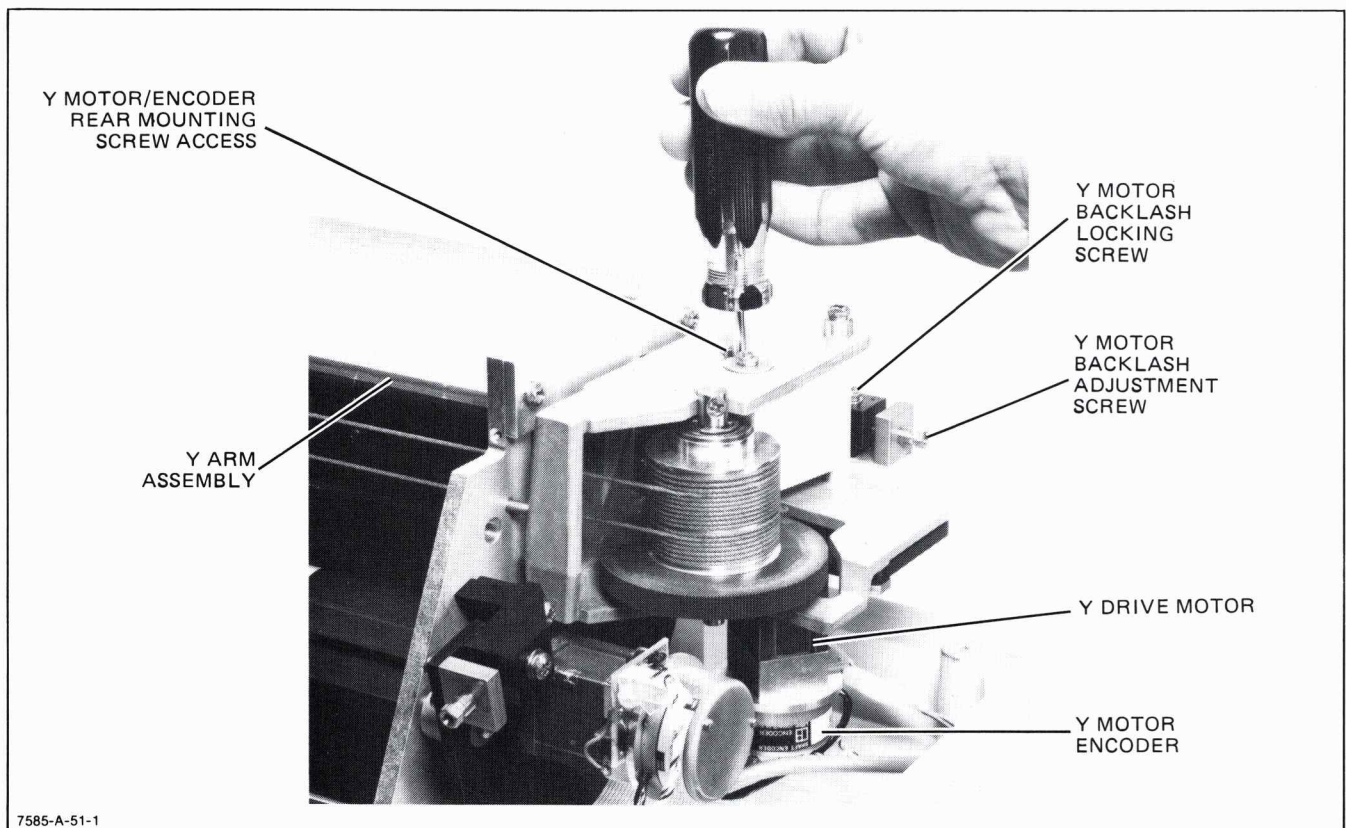


Figure 6-13. Y-Drive Motor/Encoder Replacement

6-156. JOYSTICK REPLACEMENT

6-157. To replace the joystick assembly, perform the following procedure:

- a. Turn the plotter OFF.
- b. Remove the front table and front cover. If necessary, refer to the procedure for Opening up the Plotter described in Section III.
- c. Remove the front-panel cover and disconnect the ribbon cable from the Front Panel PCA.
- d. Disconnect the joystick grounding strap and remove the joystick from the front panel.
- e. Connect the joystick wires to the new joystick assembly.
- f. Perform the joystick null adjustment procedure described in Section III before installing joystick assembly to the front panel.

6-158. PINCH ROLLER REPLACEMENT

6-159. Replacement of the pinch roller is performed as follows:

- a. Turn the plotter OFF.
- b. Raise the carriage cover to the open position.
- c. Using a 6-32 Allen wrench, loosen the pinch roller setscrew until the pinch roller axle can be slid out of the pinch roller lift arm. Refer to Figure 4-4 for the illustrated parts breakdown including the pinch roller assemblies. Remove the axle and pinch roller.
- d. Install the new pinch roller, making sure to insert the flat washer on each side of the pinch roller.
- e. Insert the pinch roller axle so that the grooved end is aligned with the setscrew hole.
- f. Tighten but do not torque the setscrew. Excessive tightening can damage the setscrew threads or pinch roller lift arm.

6-160. GRIT WHEEL REPLACEMENT

6-161. The following procedure must be performed when replacing the grit wheel assembly:

NOTE

The grit wheel replacement kit, HP part number 07580-60210, should be installed when replacement of the grit wheel is performed.

- a. Turn the plotter OFF and disconnect the ac power cord.
- b. Remove the pen carousel cover, front-panel cover, Y-arm cover, front table, rear table, and front cover. If necessary, refer to the procedure on Opening up the Plotter given in Section III.

- c. Remove the pen carriage from the plotter. If necessary, refer to the pen carriage replacement procedure given in this section.
- d. Disconnect the Y-drive motor and encoder wires.
- e. Remove the Y-arm assembly from the plotter.
- f. Remove the front and rear platens.
- g. Disconnect the Main Interconnect PCA and Paper Sensor PCA ribbon cables from J6 and J7 on the Sensor Interconnect PCA A8.
- h. Disconnect the fan motor wires and feed them down through their hole in the top of the electronics enclosure assembly.
- i. Disconnect the pen carriage, primary carriage cover microswitch, front sensor, and rear sensor cables from J1, J2, J3, and J4 on the Sensor Interconnect PCA A8. Feed the cables up through their holes in the top of the electronics enclosure assembly.
- j. Feed the Front Panel PCA ribbon cable down through its hole in the top of the electronics enclosure assembly.
- k. Disconnect the X-drive motor and encoder wires.
- l. Loosen the X-motor backlash locking and adjustment screws. See Figure 6-11.
- m. Remove the X-motor mounting plate screws and remove the plate. See Figure 6-11. Retain the three spacers and wavy washers for reassembly.
- n. Loosen the half-inch (1/2 in.) nut securing the X-spur gear to the grit wheel shaft. Remove the X-spur gear. See Figure 6-12, Detail A.
- o. Remove the four hex socket head screws and eight phillips head screws that mount the base pan and mechanical assemblies to the electronic case assembly. See Figure 6-14, Detail A.
- p. Carefully lift the mechanical assembly group from the electronic case assembly, invert the mechanical assembly group, and place the assembly group on the working surface.
- q. Remove the six screws mounting the base pan to the side plate assemblies. See Figure 6-14, Detail B. Invert the base pan and place it next to the mechanical assembly group. Avoid stressing any cables.

- r. Remove the paper sensor cover mounting screw and remove the cover. See Figure 6-14, Detail C.
- s. Remove the paper sensor assembly from the center platen assembly. Remove the rear paper stop adjustment mount. See Figure 6-14, Detail C.
- t. Remove the eleven screws mounting the fan plate and fan assembly to the center platen assembly. Remove the fan and plate. See Figure 6-14, Detail C.

(Continued on page 6-31)

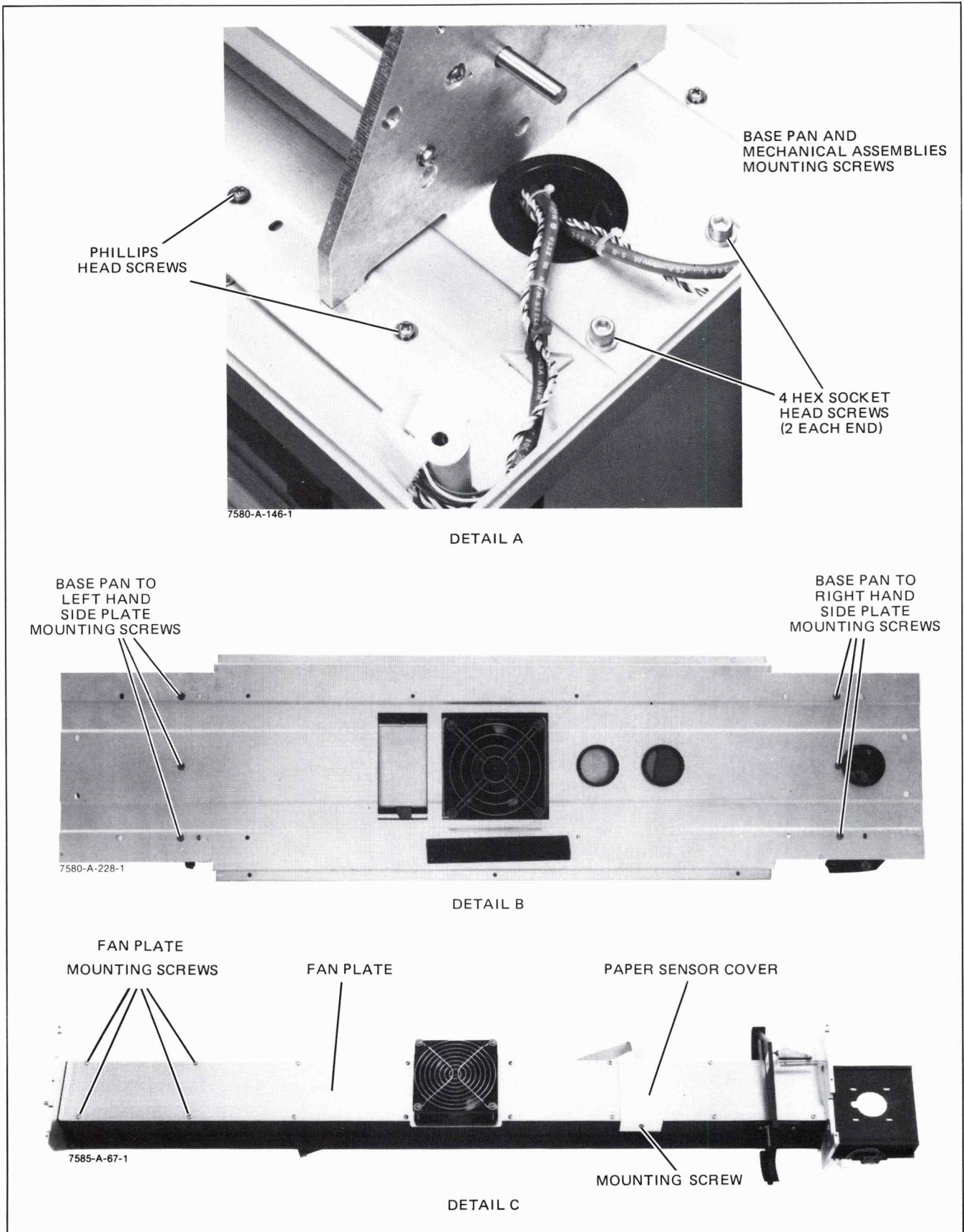


Figure 6-14. Grit Wheel Replacement (Sheet 1 of 2)

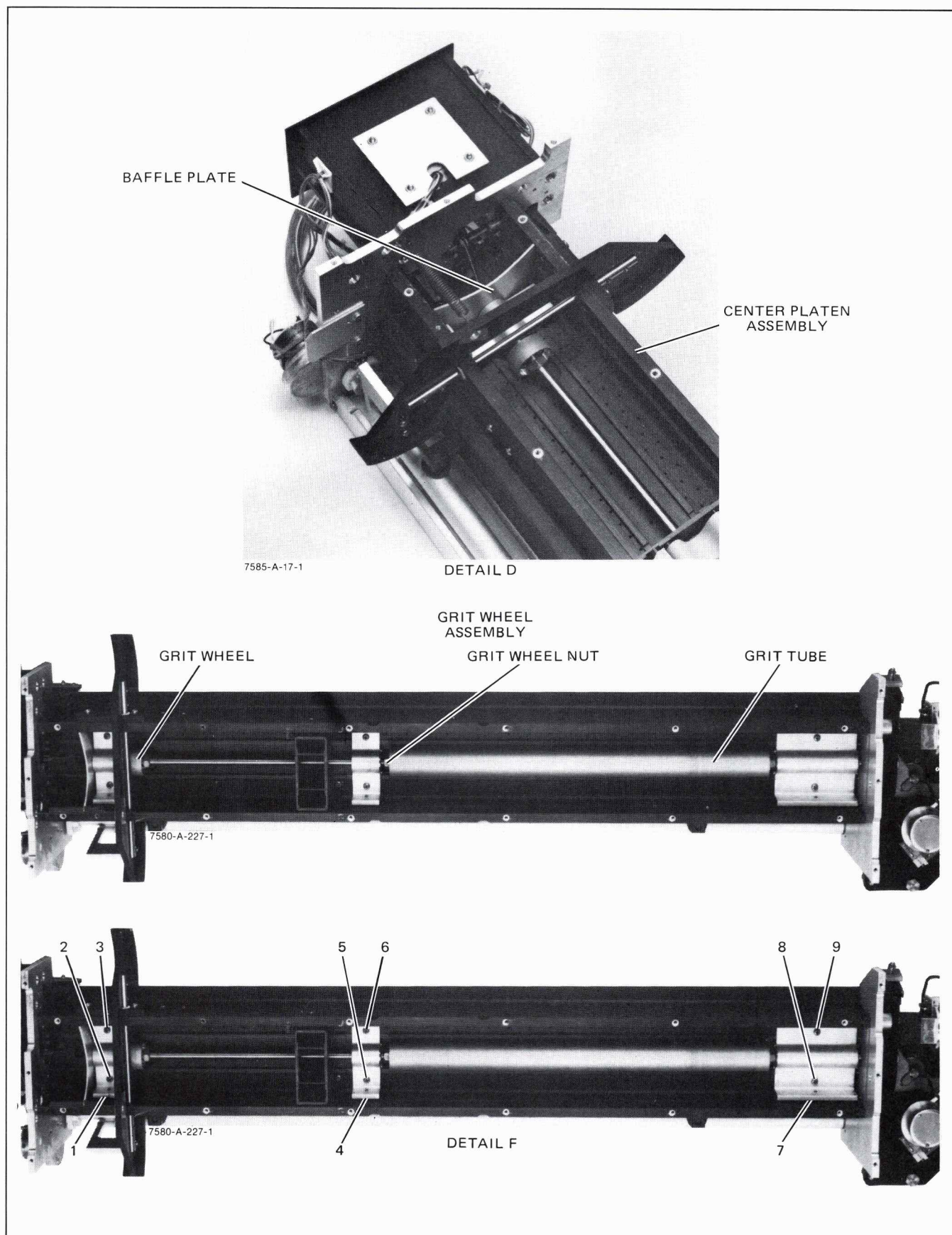


Figure 6-14. Grit Wheel Replacement (Sheet 2 of 2)

- u. Remove the baffle plate from the center platen assembly. See Figure 6-14, Detail D.
- v. Remove the nine screws securing the grit wheel assembly to the center platen assembly. Slide the grit wheel assembly toward the carousel motor and lift the grit wheel assembly from the platen.
- w. Assemble the new grit wheel. Do not tighten the grit wheel nut at this time. See Figure 6-14, Detail E.
- x. Insert the new grit wheel assembly into the center platen assembly. Make sure that the grit wheels align into their openings on the platen.
- y. Install, but do not tighten, the nine grit wheel assembly mounting screws removed in step v.
- z. Center the small grit wheel in its opening in the platen. Tighten the nine grit wheel assembly mounting screws in the sequence given in Figure 6-14, Detail F.
- aa. Apply threadlocking compound to the threads of the grit wheel nut.
- ab. Center the large grit wheel in its opening in the platen. Using two half-inch (1/2 in.) open end wrenches, one on each of the grit wheel nuts, tighten the grit wheel nut. See Figure 6-14, Detail E. Tighten the grit wheel nut to approximately 90 inch-pounds of torque.
- ac. Install the baffle plate removed in step u.
- ad. Install the fan plate and fan assembly. Slide the plate up against the right-hand side plate before tightening the eleven mounting screws.
- ae. Install the paper sensor assembly. Make sure both sensors are aligned into their openings in the platen surface.
- af. Install the paper sensor assembly cover.
- ag. Mount the base pan to the side plate assemblies with the six mounting screws removed in step q. Make sure that no cables are pinched between the base pan and the side plates.
- ah. Place the mechanical assembly group on the electronic case assembly. Do not pinch any cables between the assemblies. Insert and tighten the four hex socket head and eight phillips head mounting screws.
- ai. Reconnect the cables to J1, J2, J3, and J4 on the Main Interconnect PCA A8. Connect the ribbon cables to J6 and J7 on the Main Interconnect PCA A8.
- aj. Connect the fan motor wires.
- ak. Place the X-spur gear on the grit wheel shaft. Do not tighten the spur gear clamp nut at this time.
- al. Install the X-motor mounting plate onto the right-hand side plate.
- am. Connect the X-motor and encoder wires.
- an. Position the X-spur gear on the grit wheel shaft to where its teeth engage the teeth on the X-motor shaft. Tighten the spur gear clamp nut making sure the gear teeth remain in mesh.
- ao. Perform the X-motor backlash adjustment described in Section III of this manual.
- ap. Install the front and rear platens.
- aq. Install the Y-arm assembly onto the plotter.
- ar. Connect the Y-motor and encoder wires.
- as. Install the pen carriage on the Y-arm assembly.
- at. Install the Y-arm cover, front cover, pen carousel cover, front-panel cover, and the front and rear tables.

6-162. LOGIC SYMBOLOGY AND SCHEMATIC SYMBOLS

6-163. The ANSI Y32.14 logic symbols used in the Model 7580B service sheet schematics are shown and explained in Figure 6-15. Schematic diagram symbols used on the service sheets are shown in Figure 6-16.

6-164. SERVICE SHEETS

6-165. Foldout service sheets are provided in this section. The service sheets contain component location diagrams and schematics for the various printed circuit assemblies (PCAs) and sensors used in the Model 7580B. Component location diagrams and schematics for the HP-IB/RS-232-C (Dual I/O) Interface are contained in Appendix A at the back of this manual.

6-166. Service Sheet 1 (Figure 6-17) is an overall functional block diagram illustrating major signal flow and circuit dependency of the plotter.

6-167. Service Sheet 2 (Figure 6-20) contains the schematics for the Front Panel PCA (A4) and Internal I/O PCA (A5). Figures 6-18 and 6-19 are the respective component location diagrams for the Front Panel and Internal I/O PCAs.

6-168. Service Sheet 3 (Figure 6-22) is the schematic for the Main Interconnect PCA (A10). The component location diagram for the Main Interconnect PCA is given in Figure 6-21.

6-169. Service Sheet 4 (Figure 6-24) contains the Processor PCA (A3) schematic, and Figure 6-23 contains the Processor PCA component location diagram.

6-170. Service Sheet 5 (Figure 6-26) provides the X- and Y-Axis Servo PCA (A6) schematic diagram. The X- and Y-drive motor/encoder assemblies are also shown on this service sheet. The component location diagram for the Servo PCA is shown in Figure 6-25.


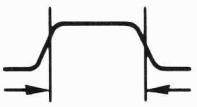

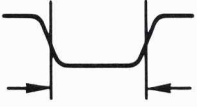

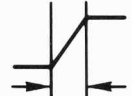


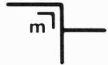
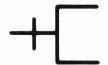


6-171. Service Sheet 6 (Figure 6-28) is the schematic diagram for the Motor Drive Transistor PCA (A9), and Figure 6-27 is the corresponding component location diagram.

6-172. Service Sheet 7 (Figure 6-30) contains the Sensor Interconnect PCA (A8) schematic. Figure 6-29 shows the component location for the PCA.

6-173. Service Sheet 8 (Figure 6-35) provides the schematics for the Carousel Sensor PCA (A7), Front Sensor PCA (A11), Rear Sensor PCA (A12), Paper Sensor PCA

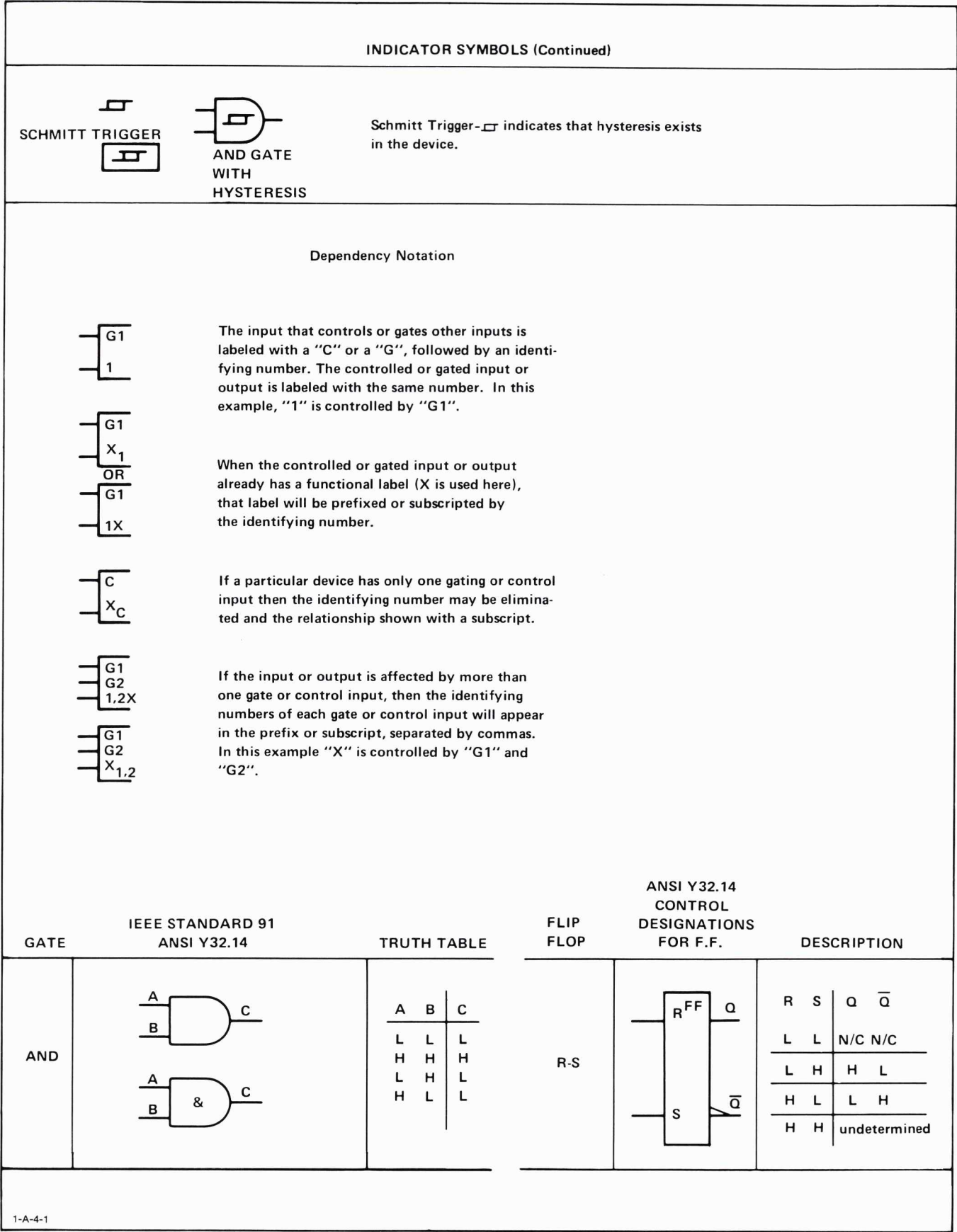
(A13), and the interlock microswitches. Component location diagrams for the Front, Rear, Carousel, and Paper Sensor PCAs are shown in Figures 6-31 through 6-34, respectively.

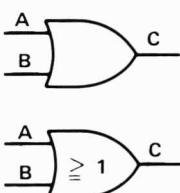
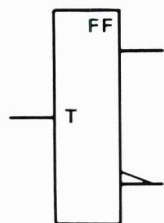
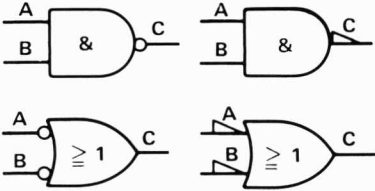
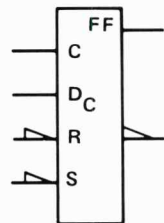
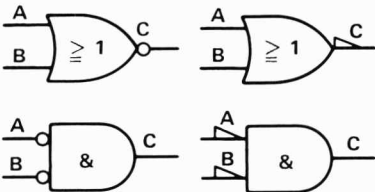
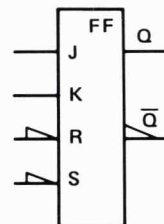
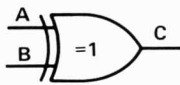

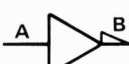
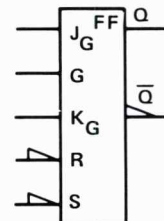
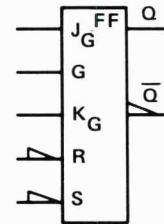
6-174. Service Sheet 9 (Figure 6-38) contains the Primary Power PCA (A14) and Power Supply PCA (A15) schematics. The power receptacle, LINE ON/OFF switch, power transformer, and fan motor are also illustrated on this service sheet. Component location diagrams for the Primary Power and Power Supply PCAs are shown in Figures 6-36 and 6-37.

INDICATOR SYMBOLS		
 HIGH LEVEL SENSITIVE	 ACTIVE PERIOD	ACTIVE HIGH inputs and outputs are indicated by the absence of the polarity indicator (Δ) or negation symbol (\circ).
 LOW LEVEL SENSITIVE	 ACTIVE PERIOD	ACTIVE LOW inputs and outputs are indicated by the presence of the polarity indicator (Δ) or negation symbol (\circ).
 LOW TO HIGH EDGE SENSITIVE	 ACTIVE PERIOD	EDGE SENSITIVE (Dynamic) inputs are indicated by the presence of the dynamic indicator symbol ($>$).
 HIGH TO LOW EDGE SENSITIVE	 ACTIVE PERIOD	
OUTPUT DELAY 		The output changes state only after the referenced input (m) returns to its inactive state. (m is replaced by appropriate dependency symbol.)
INHIBIT INPUT 		An active high state input prevents the output of that element from being active.
INHIBIT INPUT 		An active low state input prevents the output of that element from being active.
OPEN COLLECTOR OR EMITTER OUTPUT 		This output requires some external components to achieve logic state.

1-A-3-1

Figure 6-15. ANSI Y32.14 Logic Symbols (Page 1 of 11)



INDICATOR SYMBOLS (Continued)																																						
OR		<table><tr><th>A</th><th>B</th><th>C</th></tr><tr><td>L</td><td>L</td><td>L</td></tr><tr><td>H</td><td>H</td><td>H</td></tr><tr><td>L</td><td>H</td><td>H</td></tr><tr><td>H</td><td>L</td><td>H</td></tr></table>	A	B	C	L	L	L	H	H	H	L	H	H	H	L	H	 <p>Toggles with every clock pulse</p>																				
A	B	C																																				
L	L	L																																				
H	H	H																																				
L	H	H																																				
H	L	H																																				
NAND		<table><tr><th>A</th><th>B</th><th>C</th></tr><tr><td>L</td><td>L</td><td>H</td></tr><tr><td>H</td><td>H</td><td>L</td></tr><tr><td>L</td><td>H</td><td>H</td></tr><tr><td>H</td><td>L</td><td>H</td></tr></table>	A	B	C	L	L	H	H	H	L	L	H	H	H	L	H	 <p>Data output follows data input. Input is gated by C.</p>																				
A	B	C																																				
L	L	H																																				
H	H	L																																				
L	H	H																																				
H	L	H																																				
NOR		<table><tr><th>A</th><th>B</th><th>C</th></tr><tr><td>L</td><td>L</td><td>H</td></tr><tr><td>H</td><td>H</td><td>L</td></tr><tr><td>L</td><td>H</td><td>L</td></tr><tr><td>H</td><td>L</td><td>L</td></tr></table>	A	B	C	L	L	H	H	H	L	L	H	L	H	L	L	 <table><tr><th>J</th><th>K</th><th>Q</th><th>\bar{Q}</th></tr><tr><td>L</td><td>L</td><td>N/C</td><td>N/C</td></tr><tr><td>L</td><td>H</td><td>L</td><td>H</td></tr><tr><td>H</td><td>L</td><td>H</td><td>L</td></tr><tr><td>H</td><td>H</td><td>toggles</td><td>toggles</td></tr></table>	J	K	Q	\bar{Q}	L	L	N/C	N/C	L	H	L	H	H	L	H	L	H	H	toggles	toggles
A	B	C																																				
L	L	H																																				
H	H	L																																				
L	H	L																																				
H	L	L																																				
J	K	Q	\bar{Q}																																			
L	L	N/C	N/C																																			
L	H	L	H																																			
H	L	H	L																																			
H	H	toggles	toggles																																			
XOR		<table><tr><th>A</th><th>B</th><th>C</th></tr><tr><td>L</td><td>L</td><td>L</td></tr><tr><td>H</td><td>H</td><td>L</td></tr><tr><td>L</td><td>H</td><td>H</td></tr><tr><td>H</td><td>L</td><td>H</td></tr></table>	A	B	C	L	L	L	H	H	L	L	H	H	H	L	H																					
A	B	C																																				
L	L	L																																				
H	H	L																																				
L	H	H																																				
H	L	H																																				
BUF-FER		<table><tr><th>A</th><th>B</th></tr><tr><td>1</td><td>1</td></tr><tr><td>0</td><td>0</td></tr></table>	A	B	1	1	0	0																														
A	B																																					
1	1																																					
0	0																																					
INVERT-ER		<table><tr><th>A</th><th>B</th></tr><tr><td>1</td><td>0</td></tr><tr><td>0</td><td>1</td></tr></table>	A	B	1	0	0	1																														
A	B																																					
1	0																																					
0	1																																					
			 <p>J and K inputs are gated by G.</p>																																			
			 <p>This output is dependent upon negative going edge of the signal.</p>																																			

S Set input – when active causes the flip-flop to set (Asynchronous)

R Reset input – when active causes the flip-flop to reset (Asynchronous)

N/C No Change

1-A-5-1

S Set input – when active causes the flip-flop to set (Asynchronous)

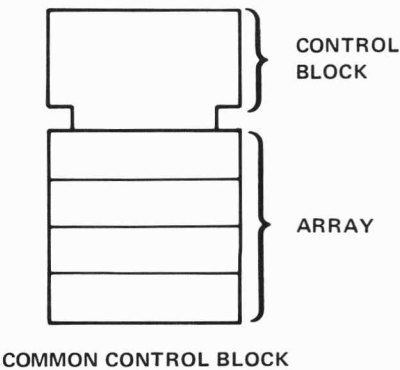
R Reset input – when active causes the flip-flop to reset (Asynchronous)

N/C No Change

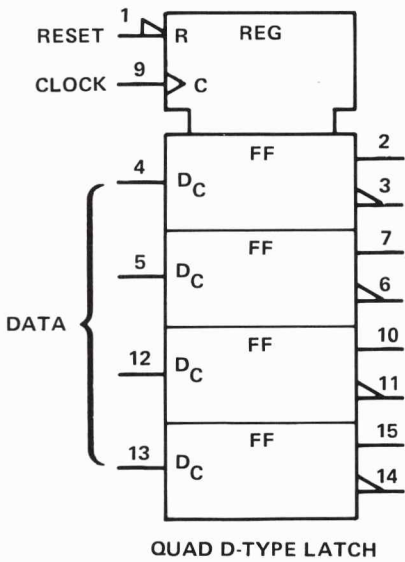
1-A-5-1

Figure 6-15. ANSI Y32.14 Logic Symbols (Page 3 of 11)

INDICATOR SYMBOLS (Continued)

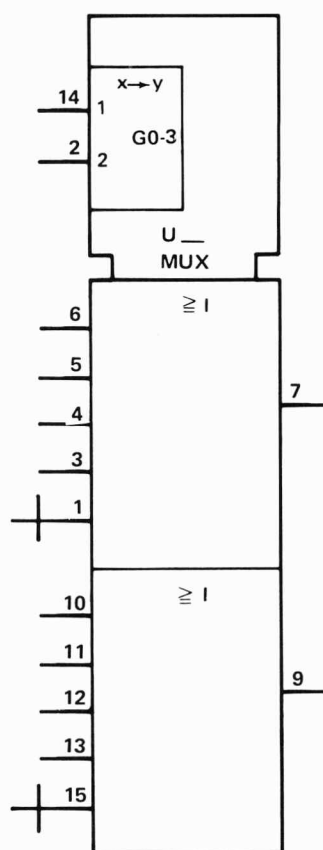


The Control Block is used to show when common control signals are applied to a group of mechanically connected, but functionally separate units.



Register control block used to illustrate a quad D-type latch. There is a common active-low reset (R), and a common edge-triggered control input (C). Since there is only one dependency relationship, the controlling input is not numbered and the controlled functions (D) are subscripted with a C.

Figure 6-15. ANSI Y32.14 Logic Symbols (Page 4 of 11)

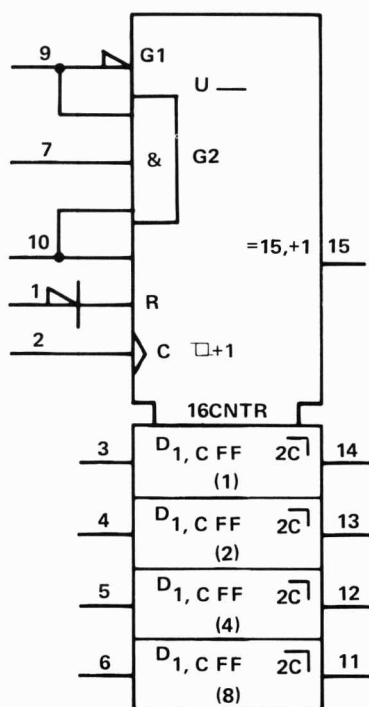


DUAL 4 TO 1 LINE DATA SELECTOR/MULTIPLEXER

Pins 14 and 2 in the control block gate both sections of the array simultaneously.

Each section of the array is essentially a four input OR with the output selected by the control input OR with the output selected by the control block. Each section also has a STROBE input capable of disabling that section.

	CONTROL		INPUT				STROBE	OUTPUT
	1	2	0	1	2	3		
DISABLE	X	X	X	X	X	X	H	L
ENABLE	L	L	L	X	X	X	L	L
INPUT	0	L	L	H	X	X	L	H
		L	H	X	L	X	L	L
	1	L	H	X	H	X	L	H
		H	L	X	X	L	X	L
	2	H	L	X	X	H	X	L
		H	H	X	X	X	L	L
	3	H	H	X	X	X	H	L



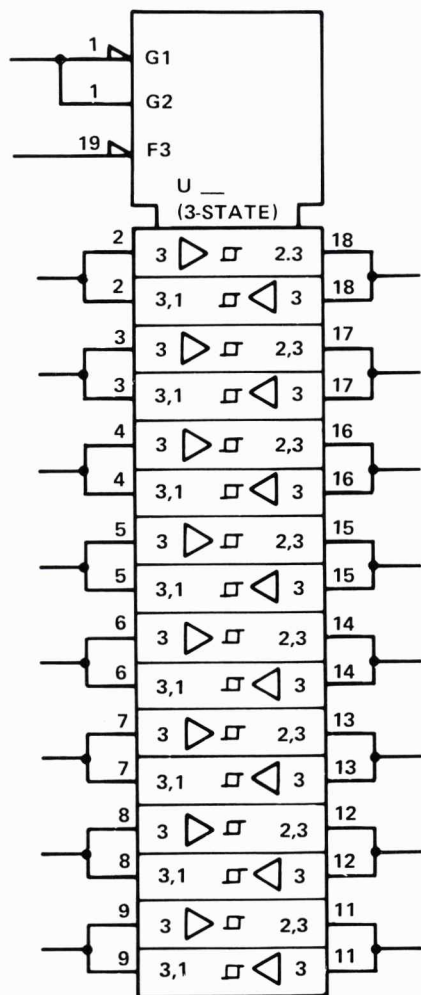
SYNCHRONOUS PRESETTABLE 4 BIT COUNTER

Pin 1(R) of the control block is an asynchronous CLEAR disabling and setting all outputs low when active (low). Pin 2 (C) is the positive edge triggered clock input. The input is buffered for noise immunity. Pins 7 and 10 are enable lines which must be high in order to enable the device. Pin 9 (G1) in the low state causes the inputs to be enabled and to be loaded on the next rising edge of the clock input. When high, Pin 9 forms the third enable to the counter.

The array consists of four flip-flops with binary weighting. The inputs are enabled by G1 and loaded by the rising edge of the clock. The outputs are enabled by the active G2 and stepped by the clock (C) input. At count 15 a pulse is output at Pin 15 Ripple Carry Output.

17603-A-28-1

Figure 6-15. ANSI Y32.14 Logic Symbols (Page 5 of 11)

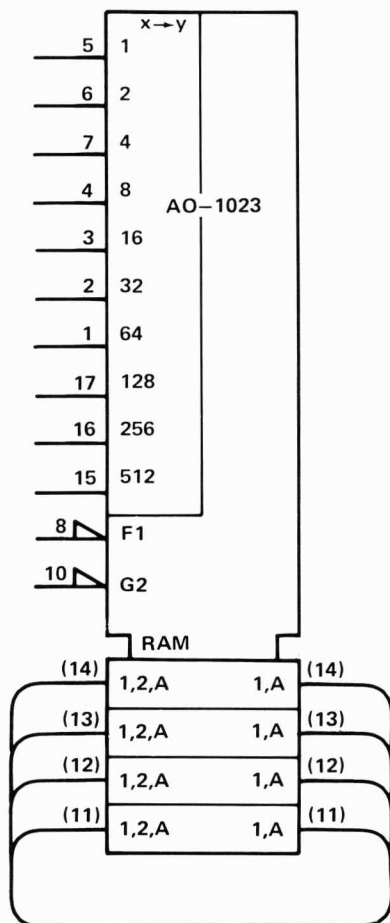


OCTAL BUS TRANSCEIVER with identical input/output lines

Pin 1 is the transmit/receive enable. A low at G1 enables the left to right flow of information, while a high at G2 will enable the right to left flow. F3 is the three state enable. A low at Pin 19 is required to enable the chip.

Each pin of the array is shown twice, once as a receiver and again as a transmitter, with the numbers of the enabling inputs of the control block given at each pin. The triangle indicates each section as a buffer, while the hysteresis symbol shows noise immunity.

Figure 6-15. ANSI Y32.14 Logic Symbols (Page 6 of 11)



RAM (with identical input/output pins)

Random Access Memory with access to 1024 locations. Address selection is determined by the 10 address input codes in the upper left corner of the control block. These lines are weighted to correspond to the possible address (AO-1023).

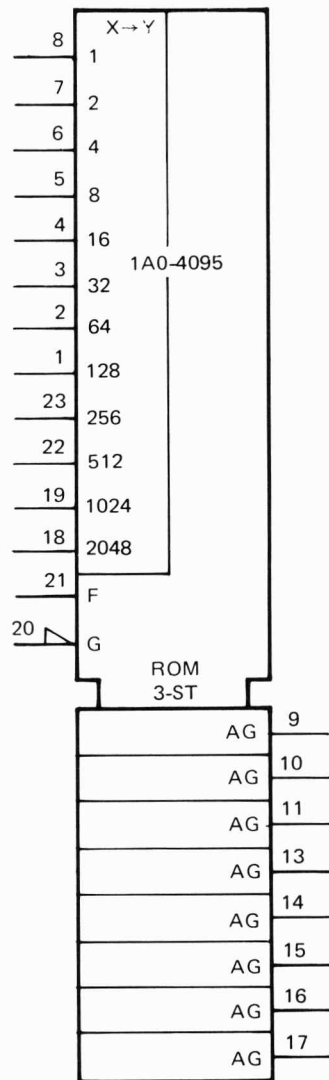
G2 is the read/write enable. A low at Pin 10 will enable the write function. A high at Pin 10 will enable the read function. F1 is the chip enable line. A low at Pin 8 will enable data to be read and written.

The input lines are noted in the lower left portion of the symbol. "1" indicates that these inputs are enabled when there is a low on pin F1. "2,A" indicates that information will be written into the chip when G2 is low at the memory location addressed (A).

The output lines are noted in the lower right portion of the symbol. "1" indicates that these outputs are enabled by the low on F1, and that the information will be read from the location addressed by "A".

Note: The input/output pins are identical. This is indicated by the signal line bundling.

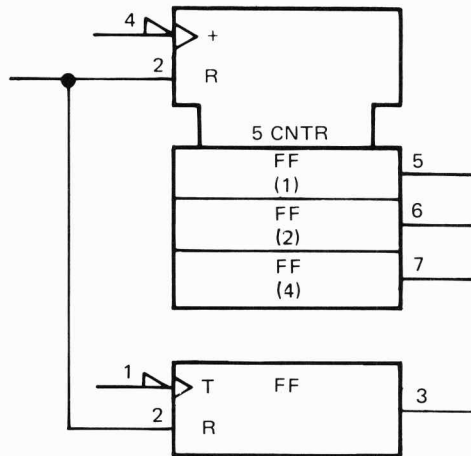
Figure 6-15. ANSI Y32.14 Logic Symbols (Page 7 of 11)

**ROM**

Read Only Memory with 4096 addresses. Address selection is determined by the bit address inputs in the upper left corner of the control block. F is the 3 state enable line. A High on this line will enable the outputs. G is the read enable. A high will enable the read function.

AG on the outputs indicates the dependency upon the 3 state enable and the memory location addressed

Figure 6-15. ANSI Y32.14 Logic Symbols (Page 8 of 11)



Dual $\div 2, \div 5$ Counter. Pins 14 and 2 gate the sections. Each section contains 4 master slave flip flops and gating to implement an individual 4-bit counter. Parallel outputs from the sections allow any submultiple of the input count frequency.

A High input to clear resets all outputs low.

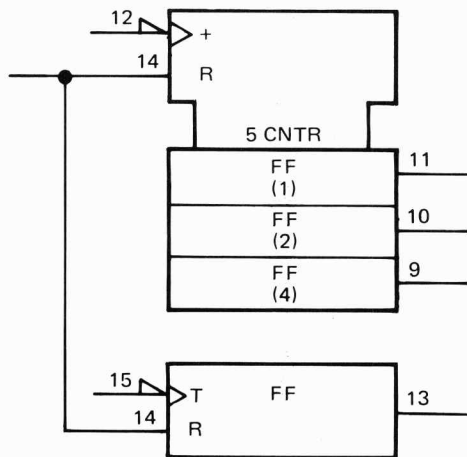
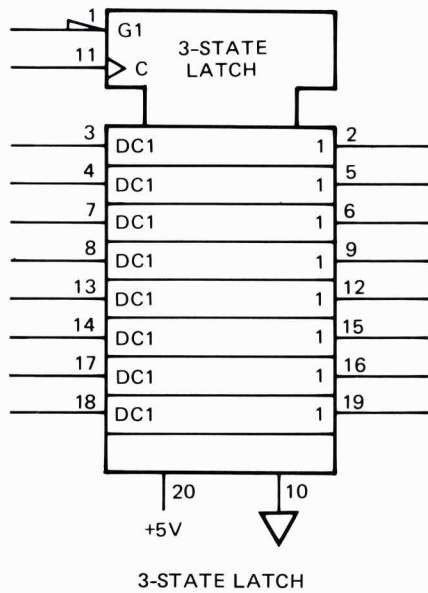
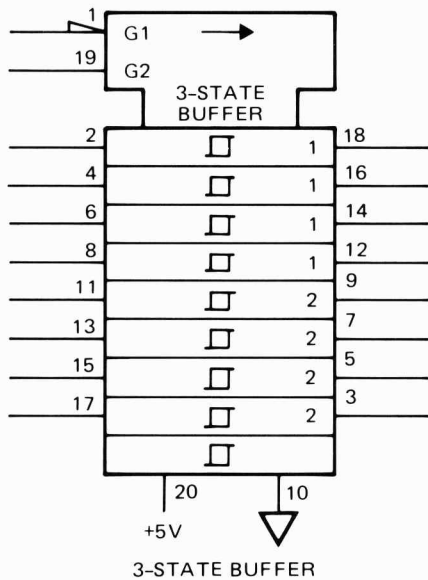


Figure 6-15. ANSI Y32.14 Logic Symbols (Page 9 of 11)



1-A-12-1

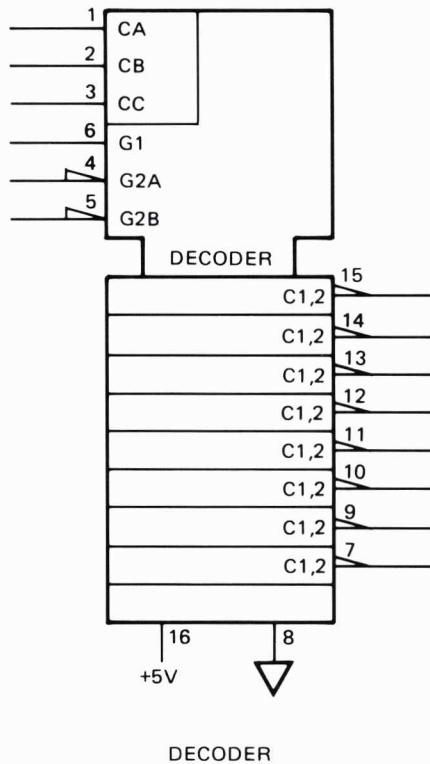
Low input G1 enables clock input C to transfer D inputs to the outputs at the low to high transition of C. A high level at G1 set all outputs to high impedance.



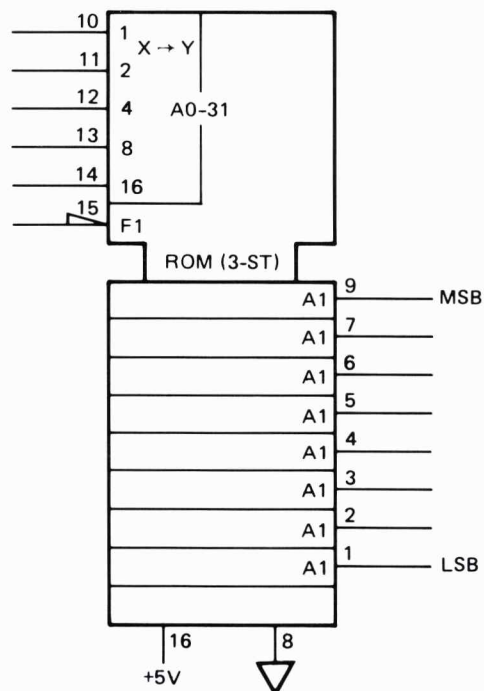
1-A-11-1

Outputs at pins 12, 14, 16, and 18 are enabled when gate G1 is low, and are high impedance when G1 is high. Outputs at pins 3, 5, 7, and 9 are enabled when G2 is high, and are high impedance when G2 is low. Hysteresis in each buffer improves noise immunity.

Figure 6-15. ANSI Y32.14 Logic Symbols (Page 10 of 11)



One of eight outputs is low and the remaining outputs are high, depending on the address CA, CB, and CC in the upper left corner of the control block. Output is enabled when gate G1 is high and either G1A or G1B is low. When G1 is low or either G1A or G1B is high, all outputs are high.



Read Only Memory with 32 addresses and 8-bit parallel output. Each output byte is selected by the 5-bit address in the upper left corner of the control block. Output is enabled when G1 is low.

Figure 6-15. ANSI Y32.14 Logic Symbols (Page 11 of 11)

SCHEMATIC DIAGRAM NOTES

Resistance in ohms, capacitance in microfarads, inductance in millihenries unless otherwise noted.



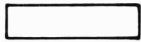
Indicates a NOTE on the schematic diagram.



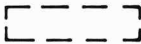
Tool-aided adjustment.



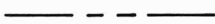
Manual control.



Encloses a front-panel or circuit assembly silkscreened designator.



Encloses a rear-panel silkscreened designator.



Circuit assembly borderline.



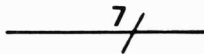
Other assembly borderline. Also used to indicate mechanical interconnection (ganging) and RF shielding.



Heavy line with arrows indicates path and direction of main signal.



Heavy dashed line with arrows indicates path and direction of main feedback.



Indicates cable run with seven lines.



Wiper moves toward CW with clockwise rotation of control (as viewed from shaft or knob).



Numbered Test point. Measurement aid (metal post, circuit pad, etc.) provided.



Lettered Test point. No measurement aid provided.



Encloses wire color code. Code used is the same as the resistor color code. First number identifies the base color, second number identifies the wider stripe, third number identifies the narrower stripe (e.g., (947) denotes white base, yellow wide stripe, violet narrow stripe).



A direct conducting connection to the earth, or a conducting connection to a structure that has a similar function (e.g., the frame of an air, sea, or land vehicle).



A conducting connection to a chassis or frame.



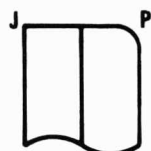
Common connections. All like-designated points are connected. When accompanied by a letter, indicates the type common (i.e., A = Analog, D = Digital, F = Floating).

Figure 6-16. Schematic Diagram Symbols (Sheet 1 of 2)

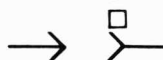
SCHEMATIC DIAGRAM NOTES (Continued)



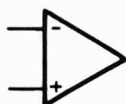
Light Emitting Diode (LED).



Cable and circuit assembly connectors.



Circuit assembly square-pin connectors.



Operational Amplifier (integrated circuit).



Voltage regulator (breakdown diode).



Denotes Field Effect transistor (FET) with N-type base.



Denotes FET with P-type base.



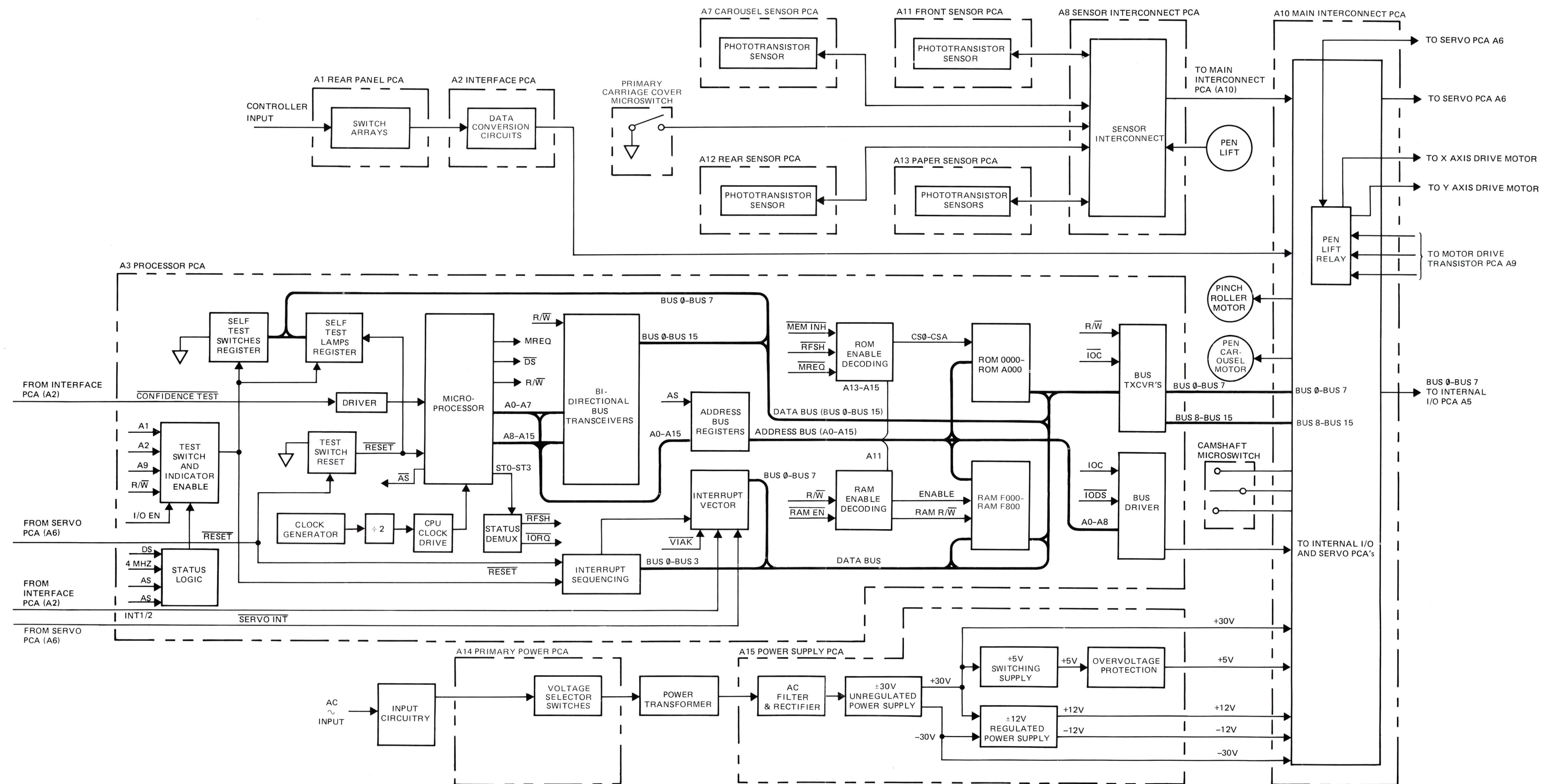
Denotes Silicon Controlled Rectifier (SCR).



Denotes spring-loaded switch.

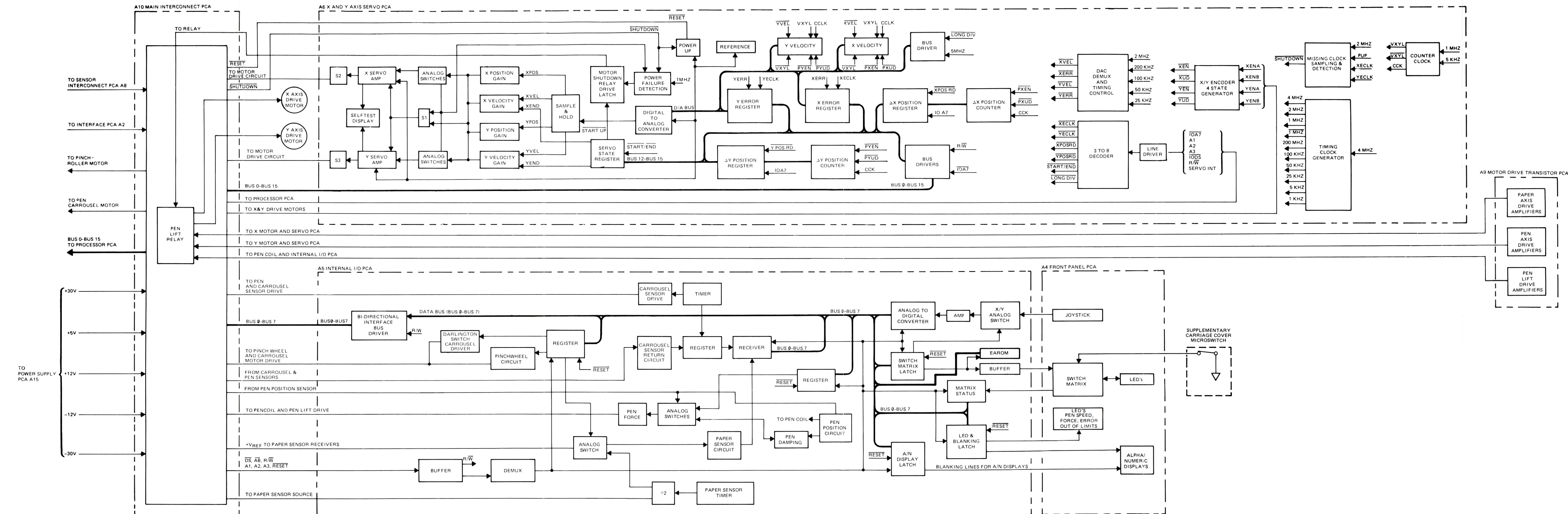


Identifies service sheet for quick reference.



1
SERVICE SHEET

Figure 6-17. Model 7580B
Functional Block Diagram (Sheet 1 of 2)



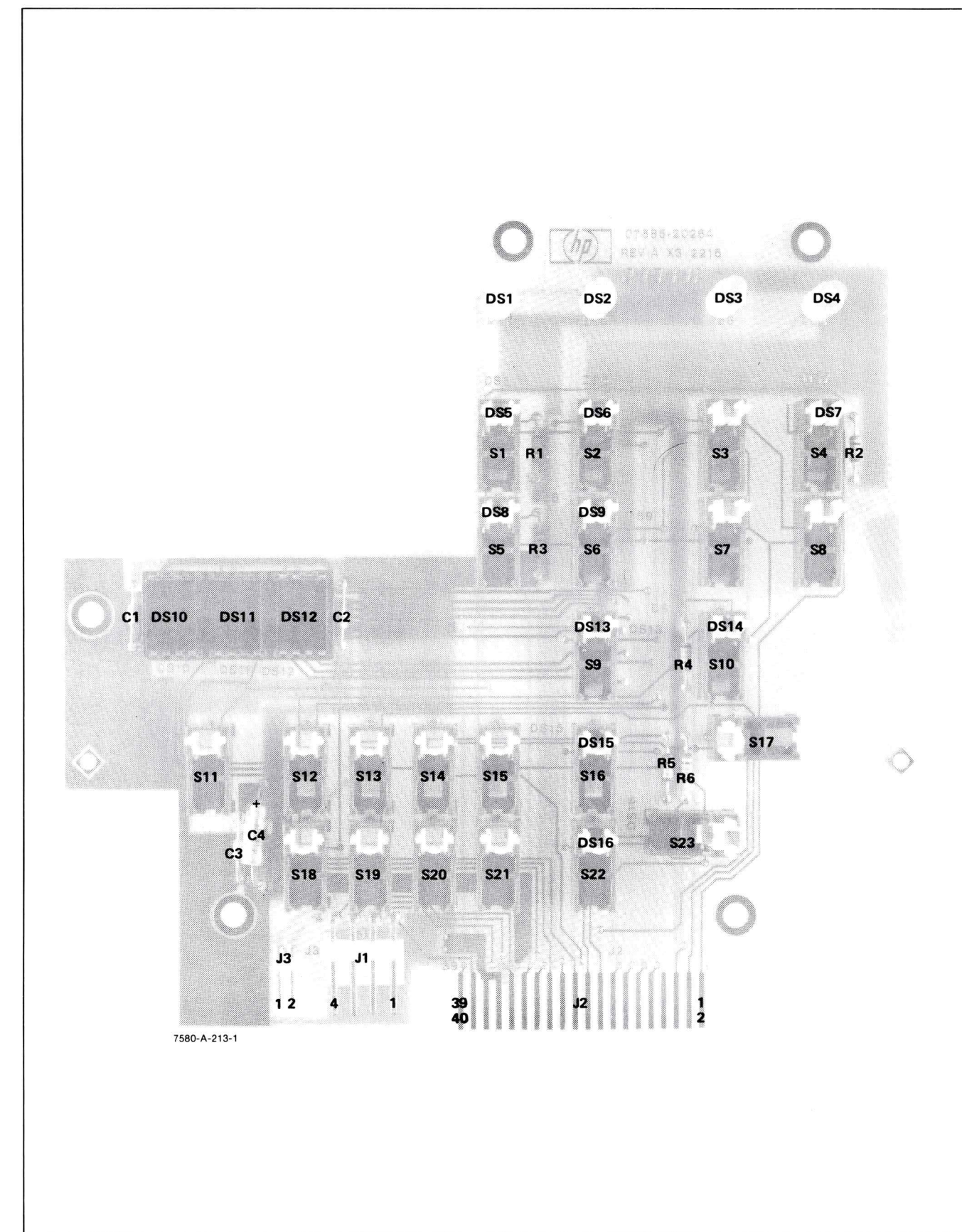


Figure 6-18. Front Panel PCA A4, Component Identification Diagram



4-2A



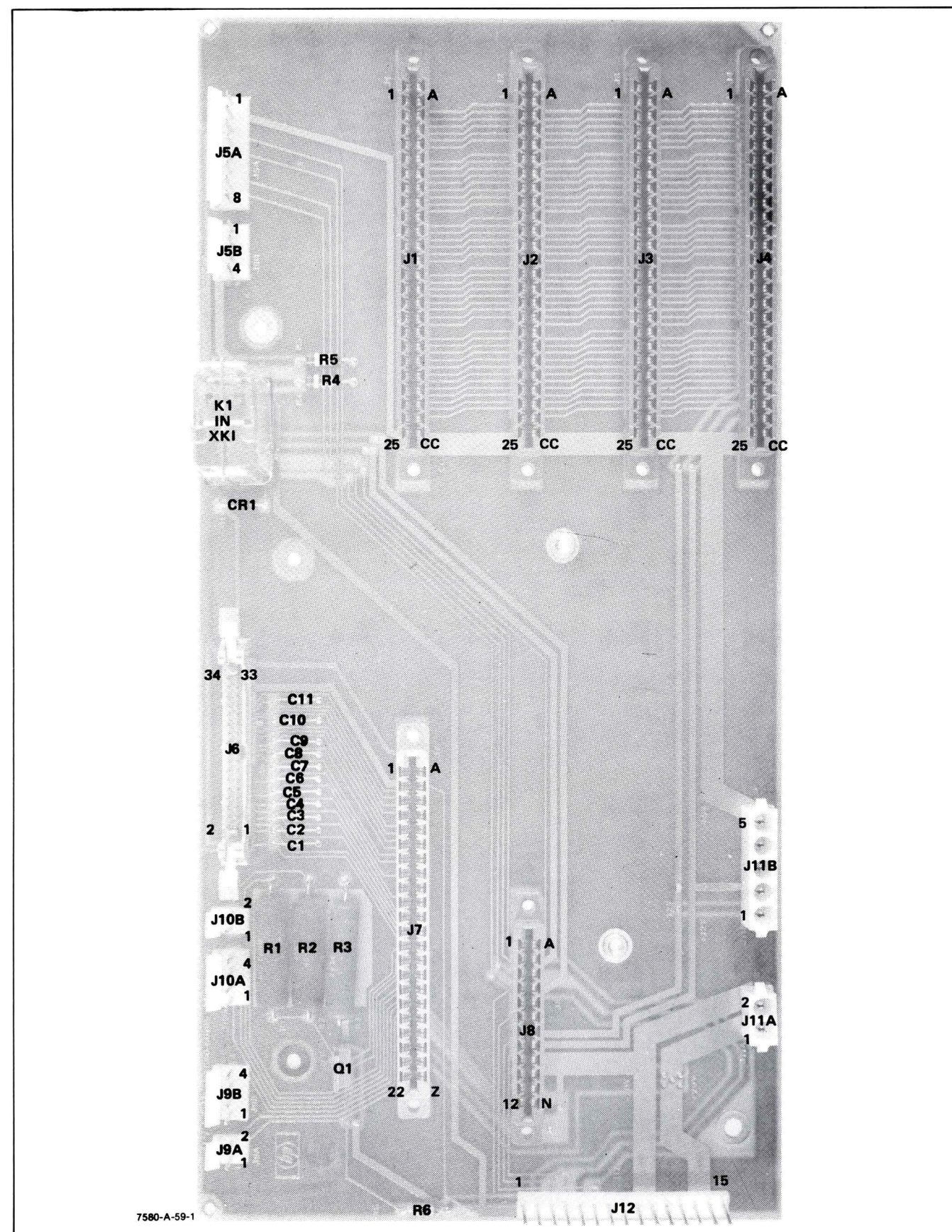


Figure 6-21. Main Interconnect PCA A10, Component Identification Diagram

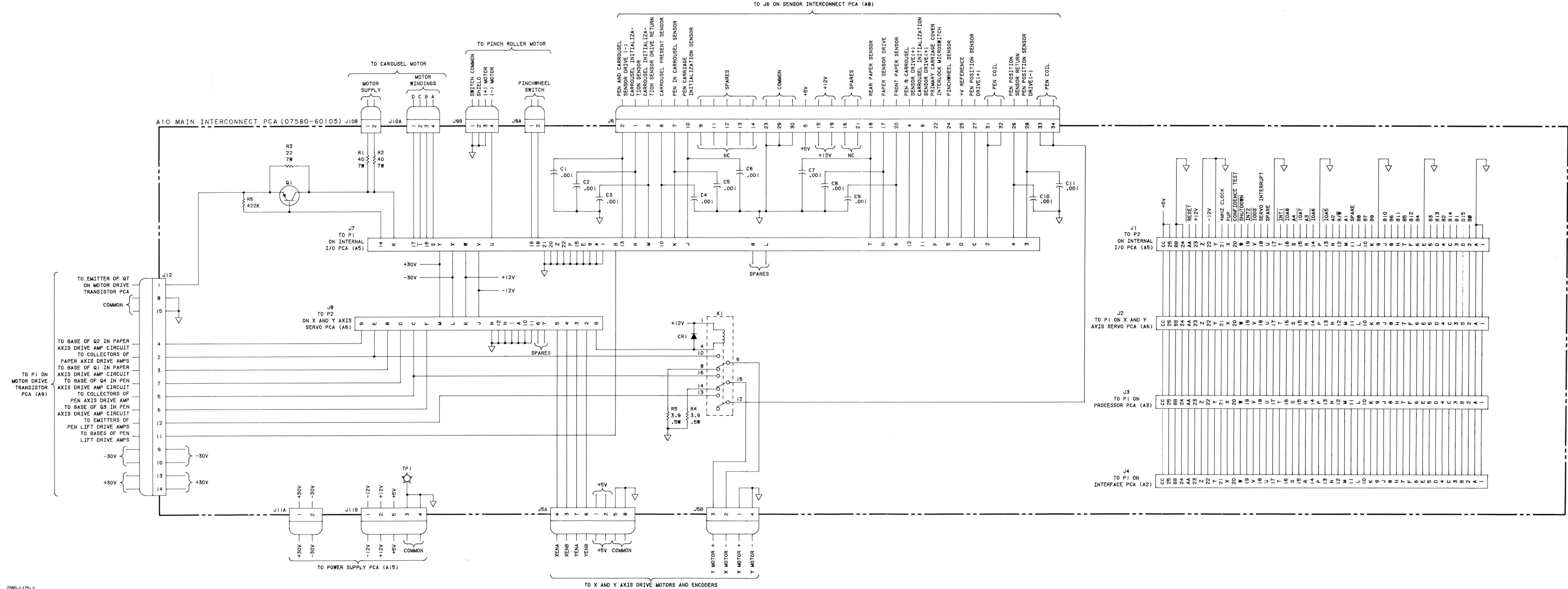


Figure C-22. Main Interconnect PCA A10, Schematic Diagram

3

SERVICE SHEET

Figure C-22. Main Interconnect PCA A10, Schematic Diagram

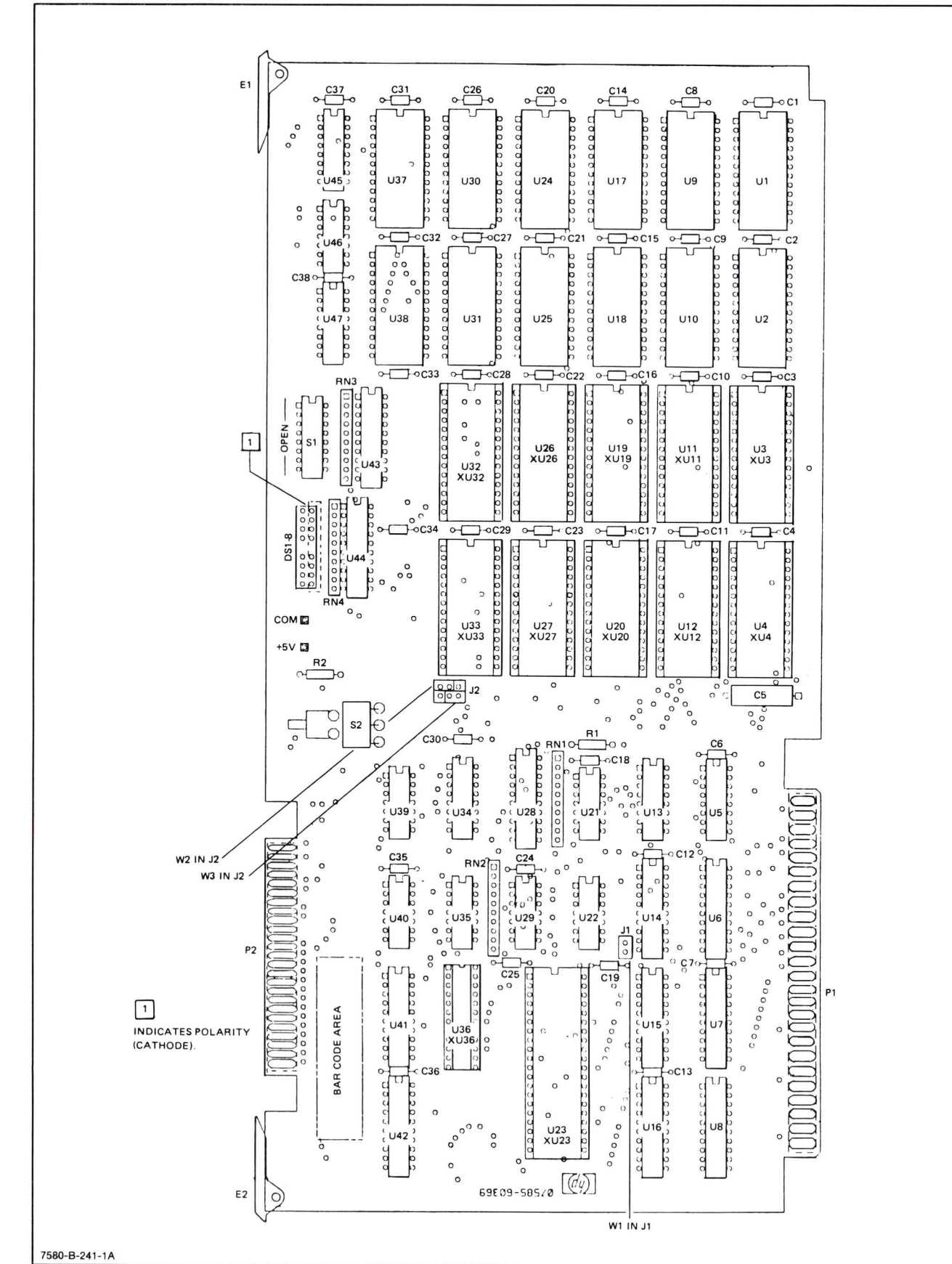
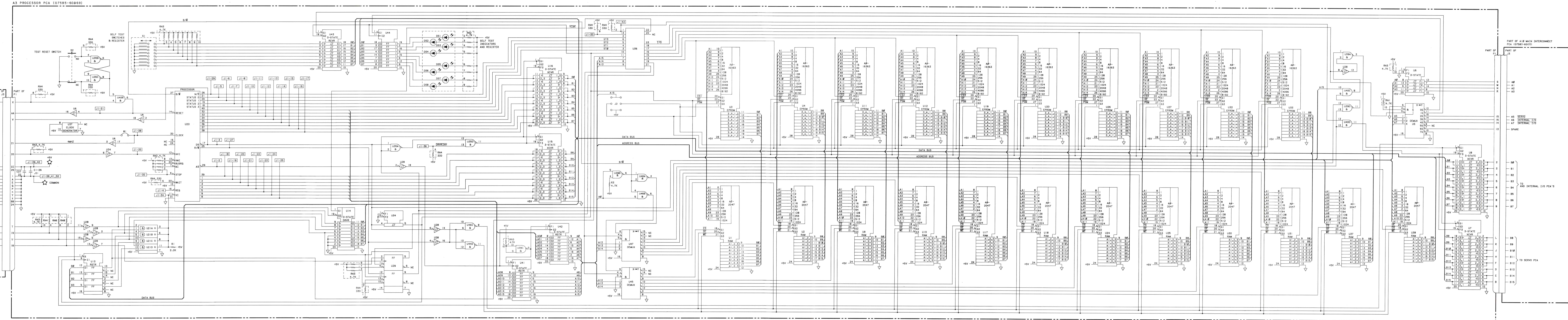


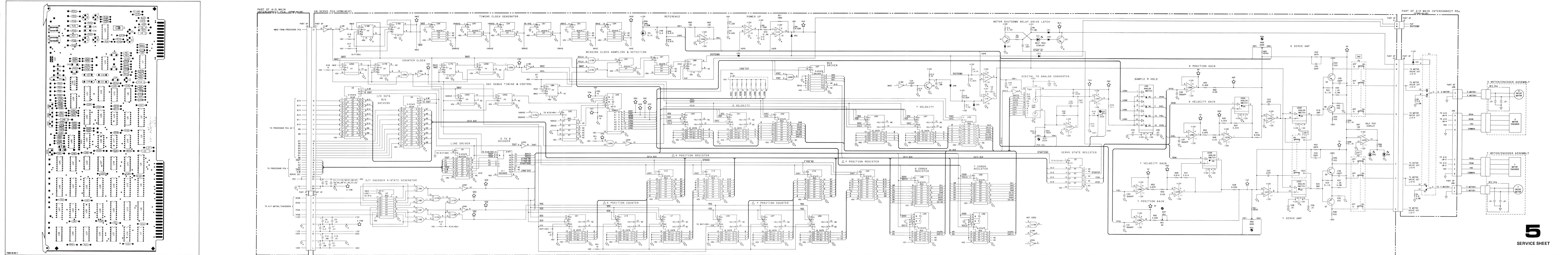
Figure 6-23. Processor PCA A3, Component Identification Diagram



4

SERVICE SHEET

Figure 6-24. Processor PCA A3, Schematic Diagram



7580-B-62-1

Figure 6-25. X- and Y-Axis Servo PCA A6, Component Identification Diagram

7580-J-177-1A

Figure 6-26. X- and Y-Axis Servo PCA A6, Schematic Diagram

657/658

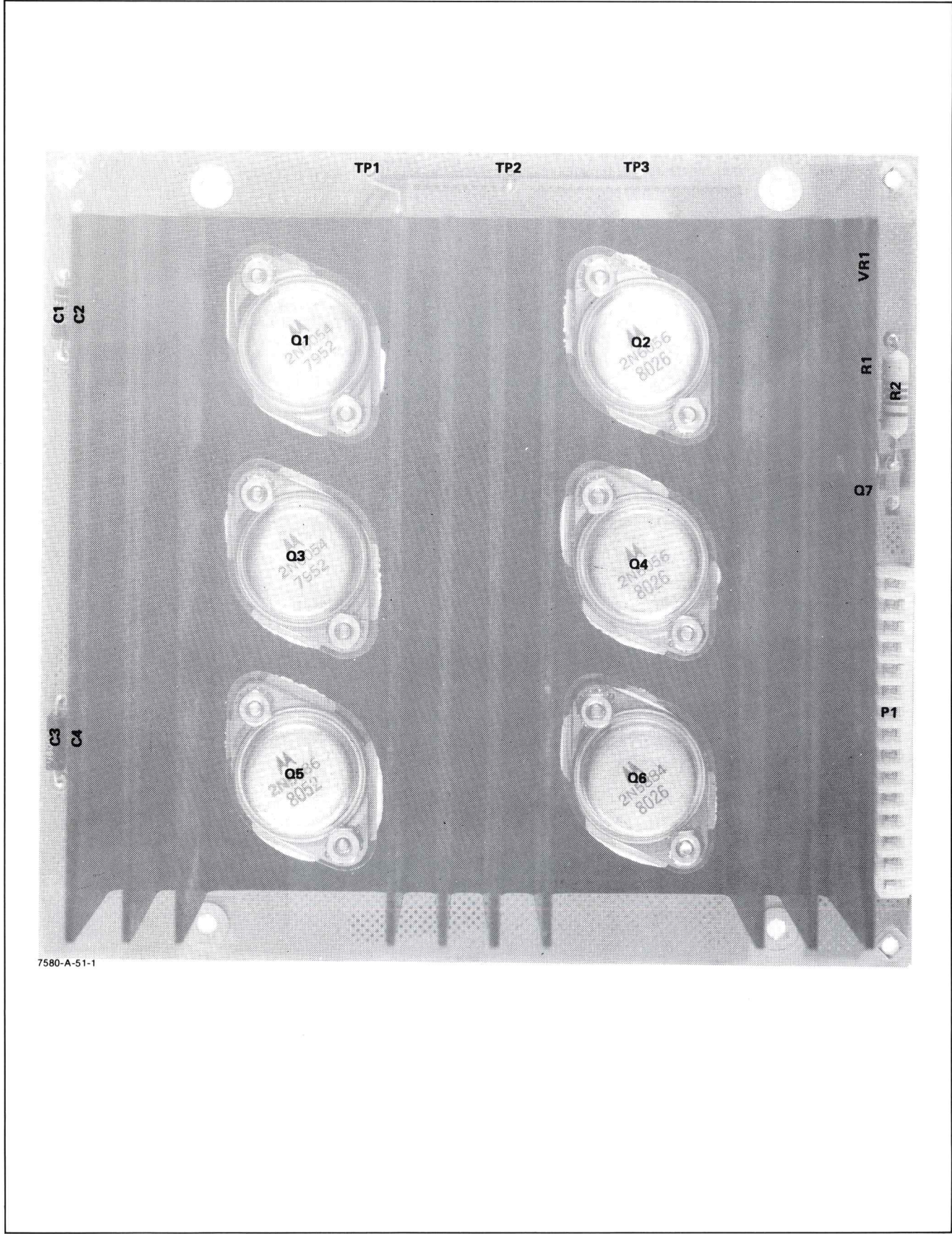


Figure 6-27. Motor Drive Transistor PCA A9, Component Identification Diagram

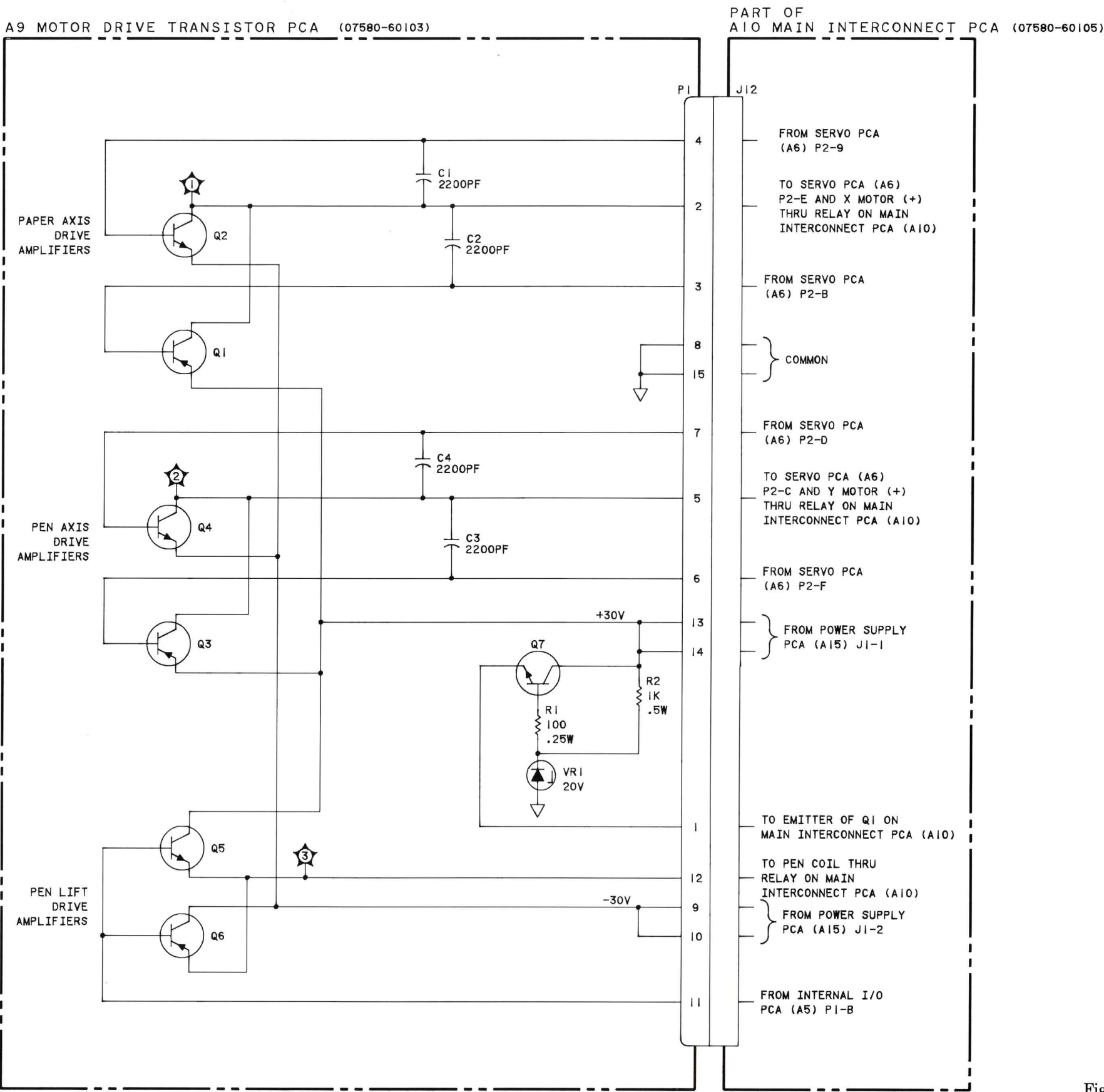


Figure 6-28. Motor Drive Transistor PCA A9, Schematic Diagram

6

SERVICE SHEET

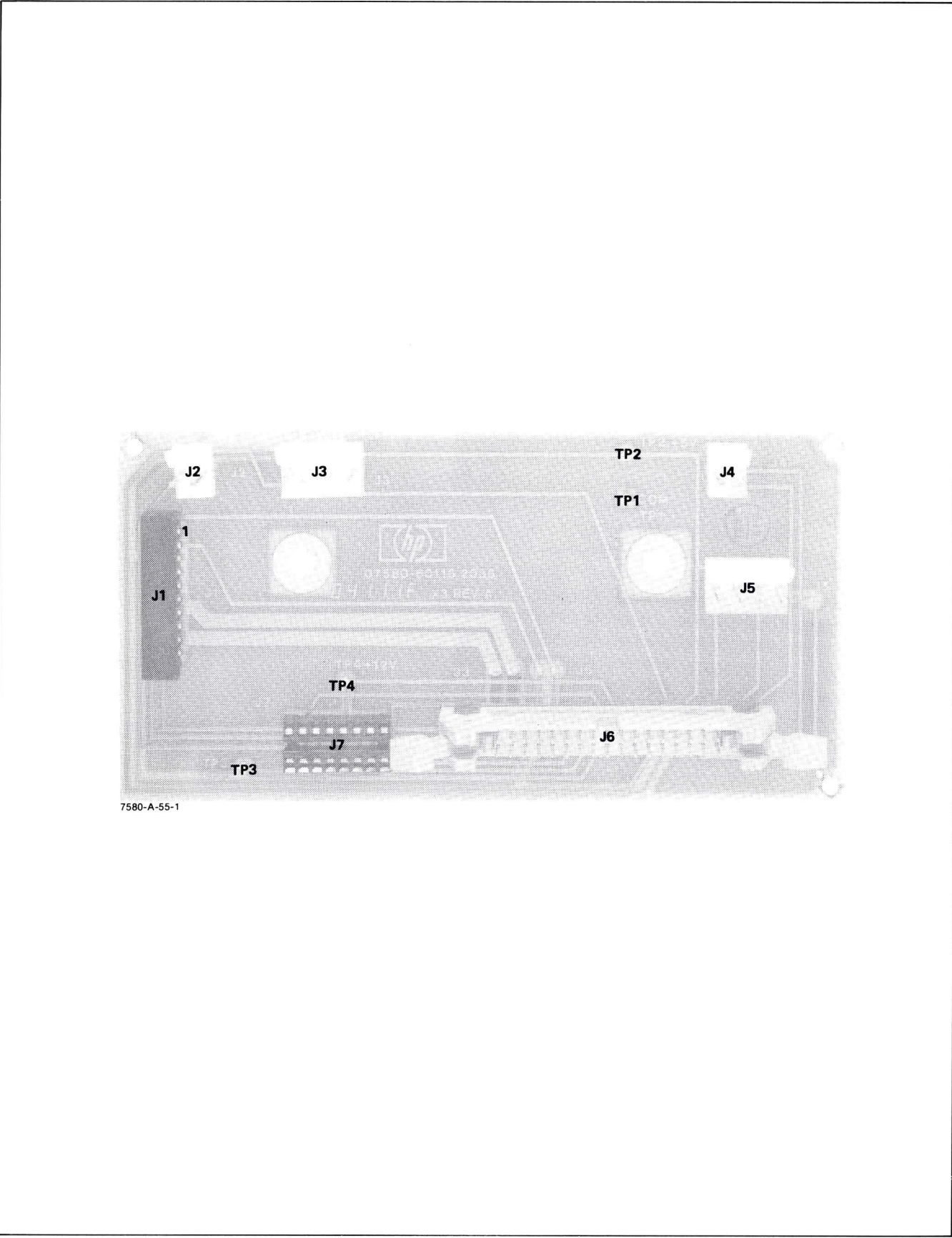


Figure 6-29. Sensor Interconnect PCA A8, Component Identification Diagram

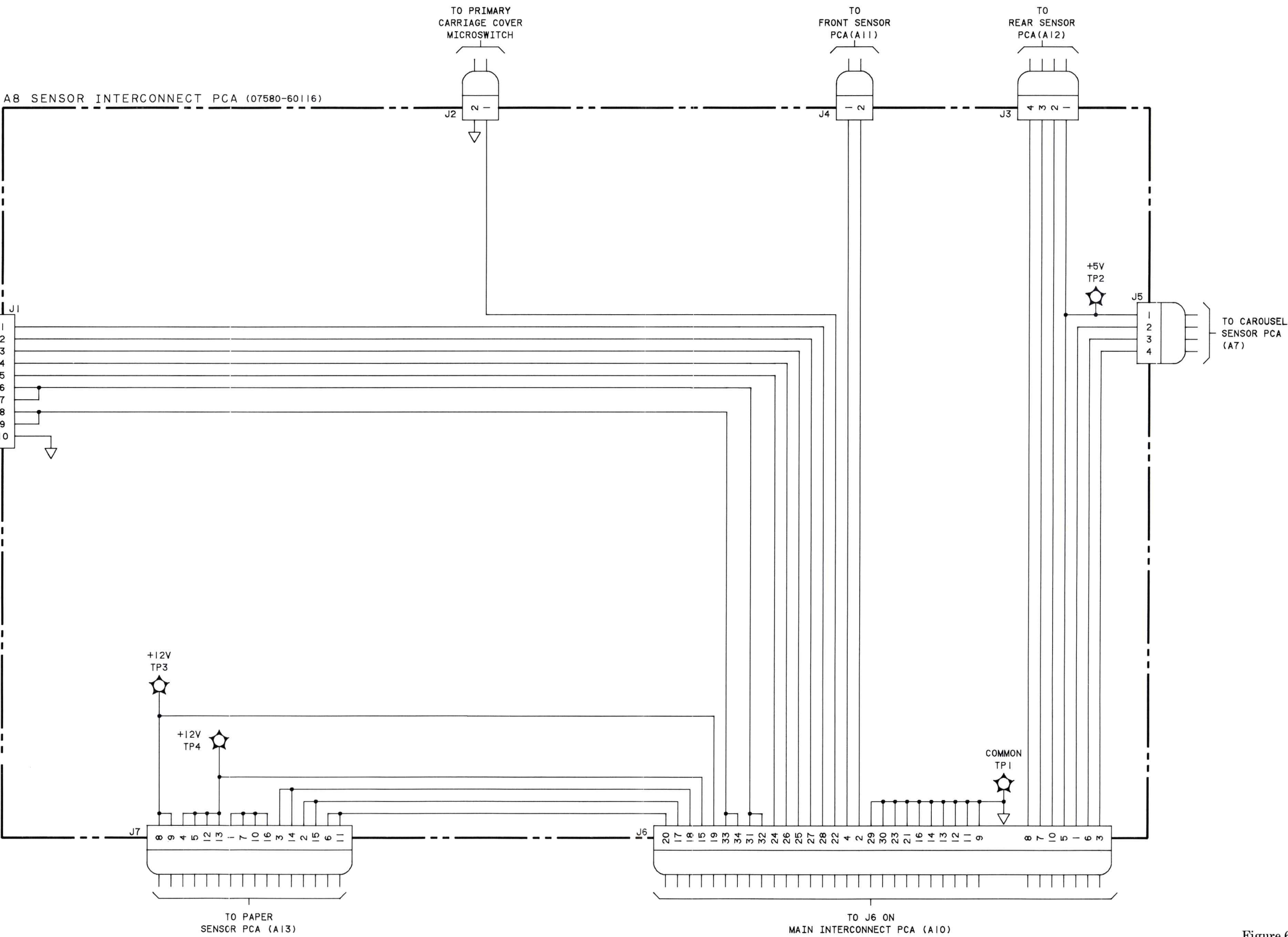


Figure 6-30. Sensor Interconnect PCA A8, Schematic Diagram

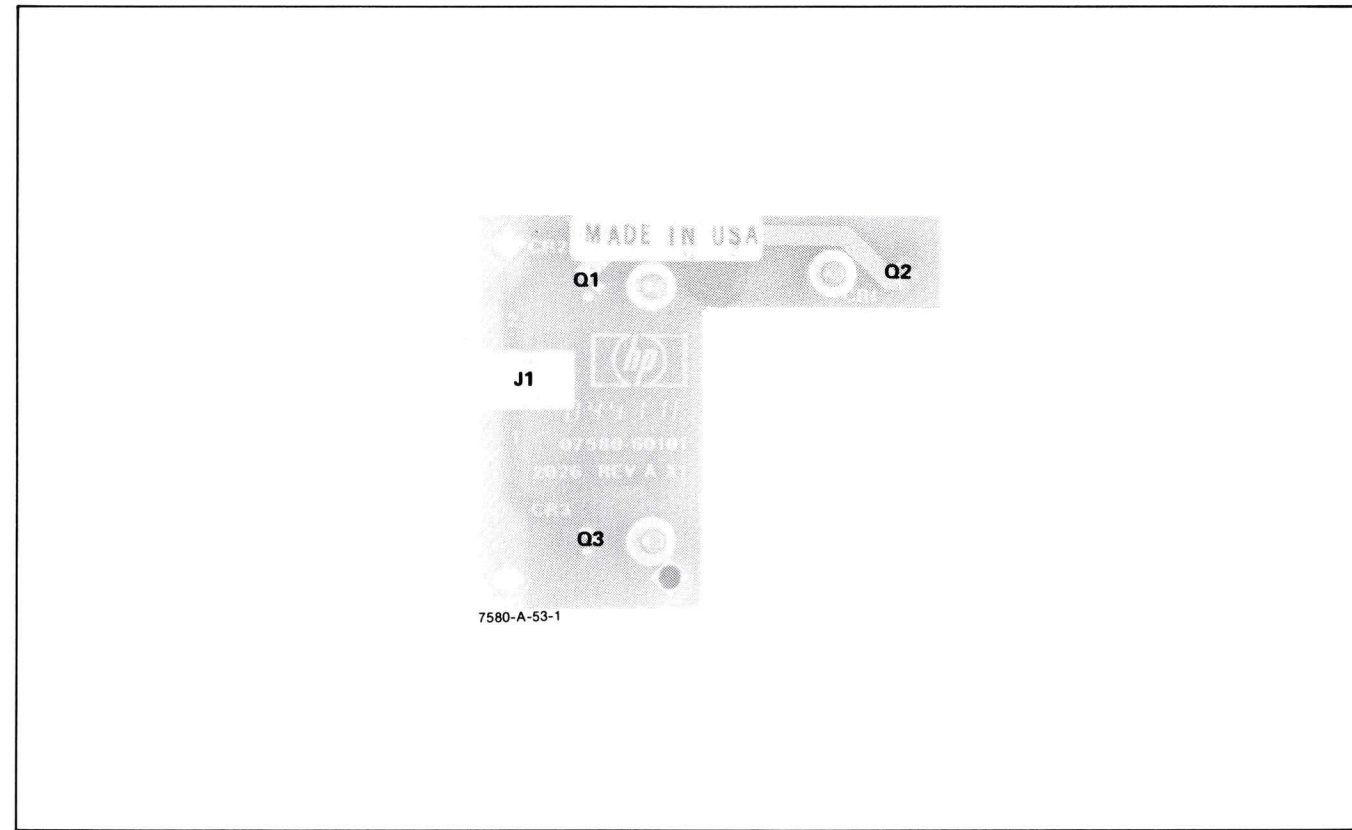


Figure 6-31. Front Sensor PCA A11, Component Identification Diagram

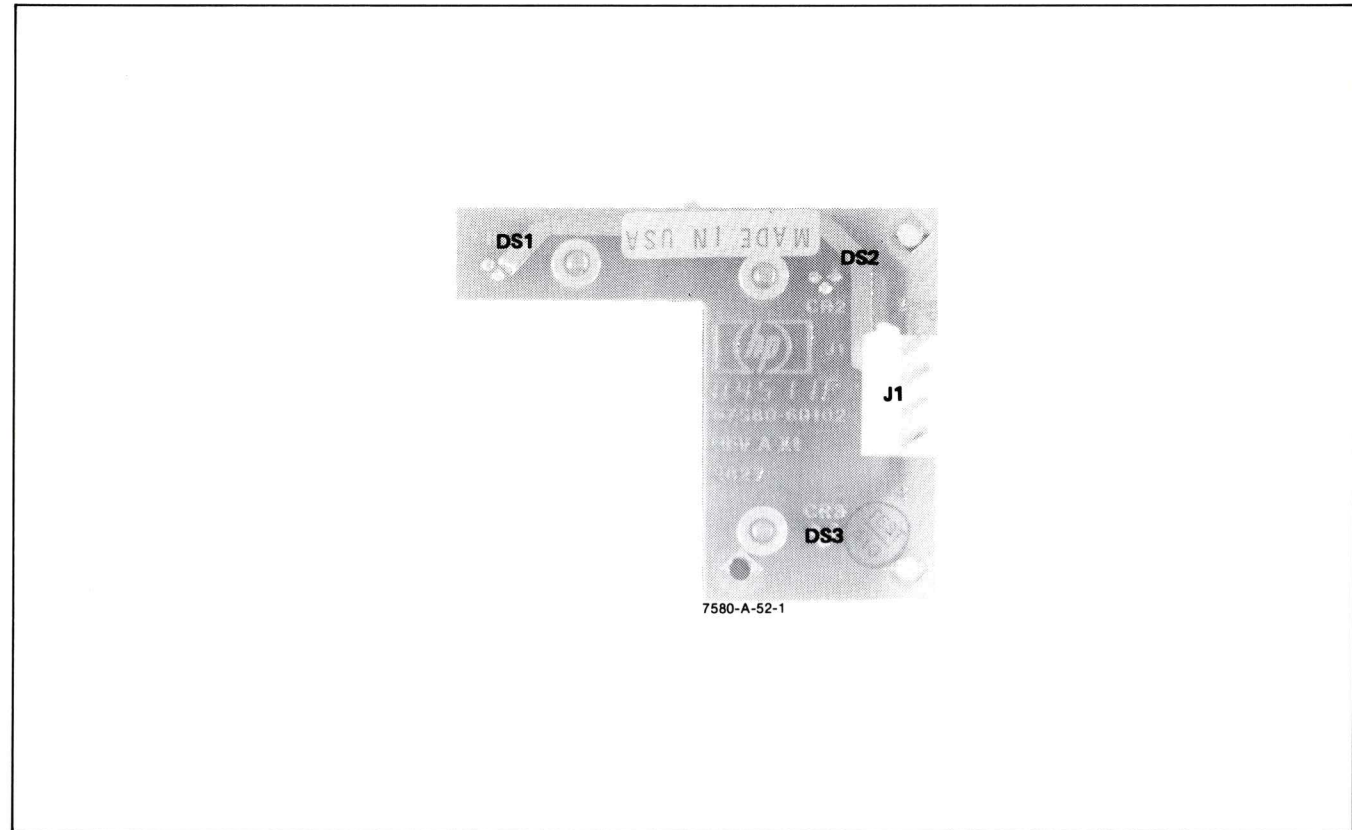


Figure 6-32. Rear Sensor PCA A12, Component Identification Diagram

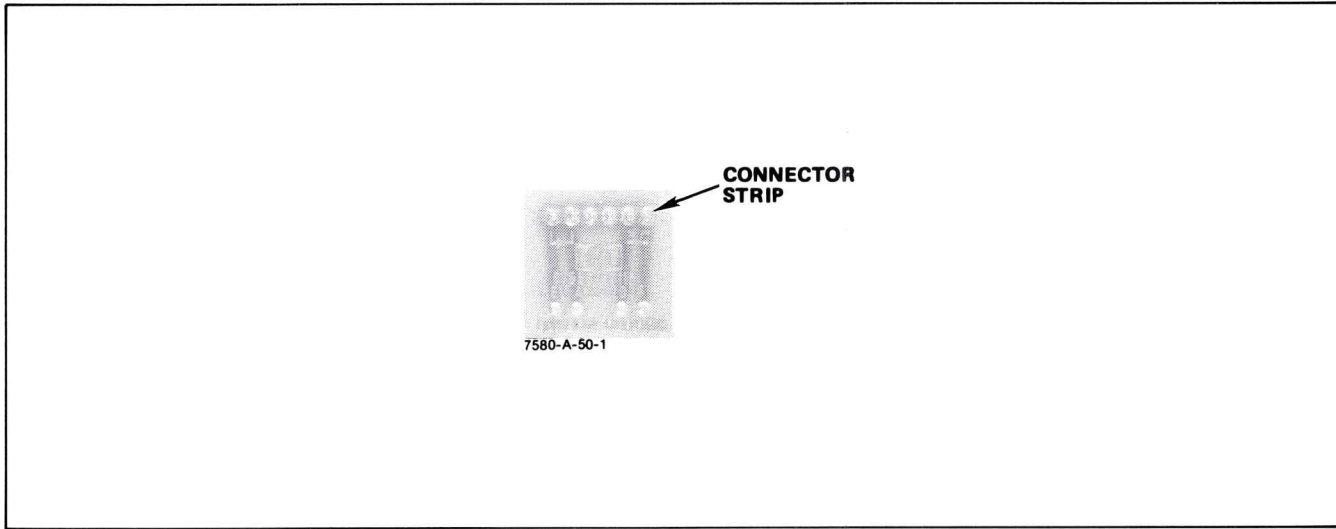


Figure 6-33. Carousel Sensor PCA A7, Component identification Diagram

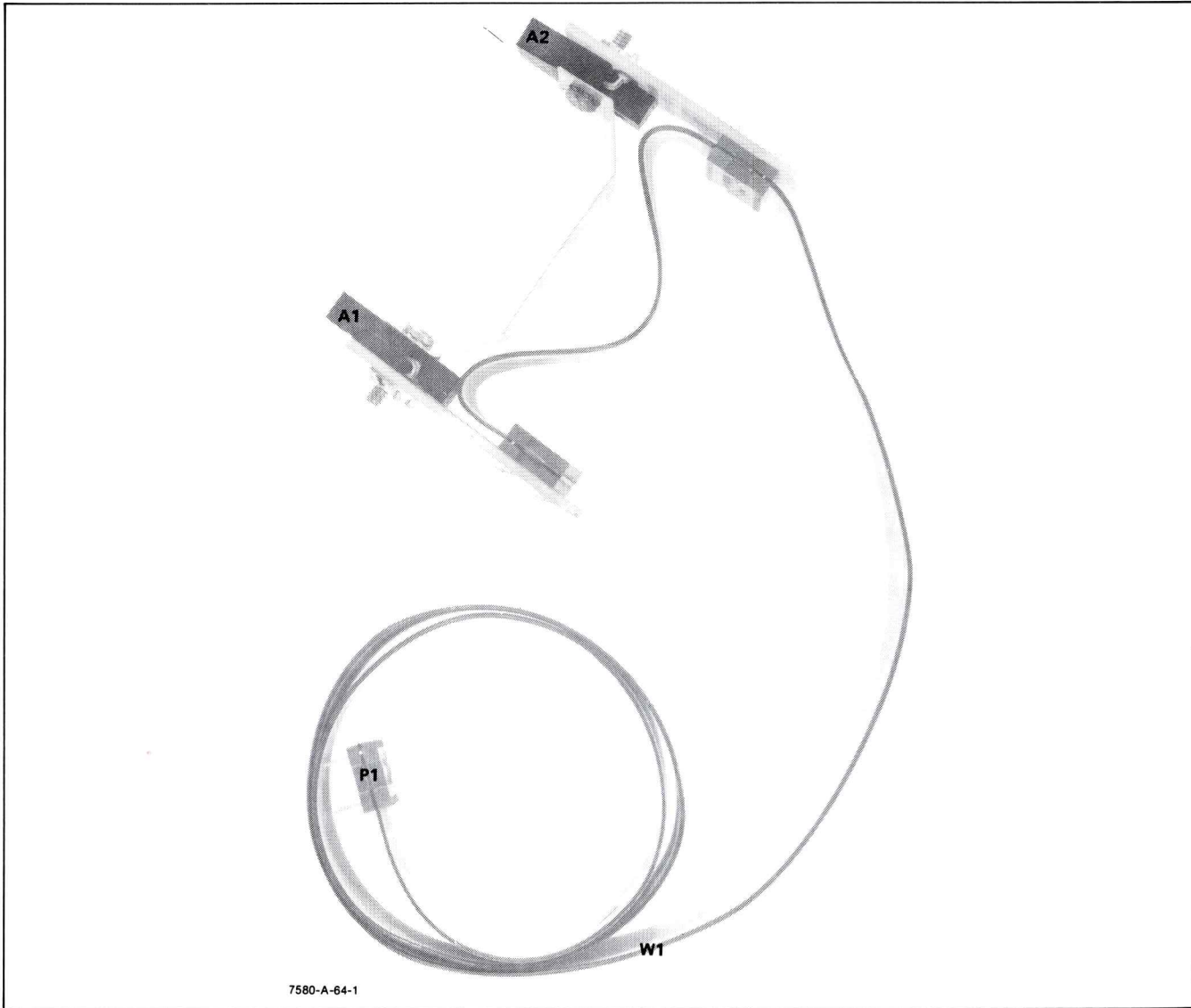


Figure 6-34. Paper Sensor PCA A13, Component Identification Diagram

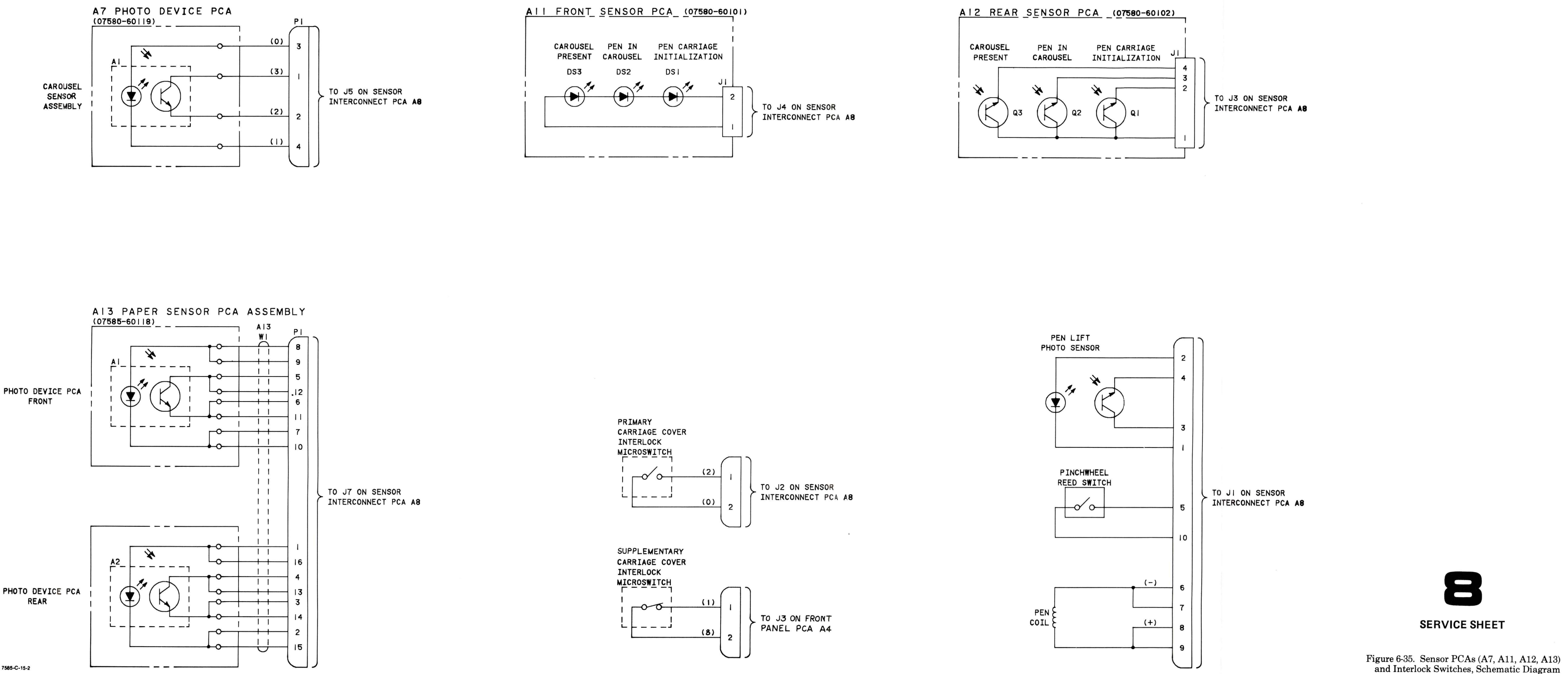


Figure 6-35. Sensor PCAs (A7, A11, A12, A13) and Interlock Switches, Schematic Diagram

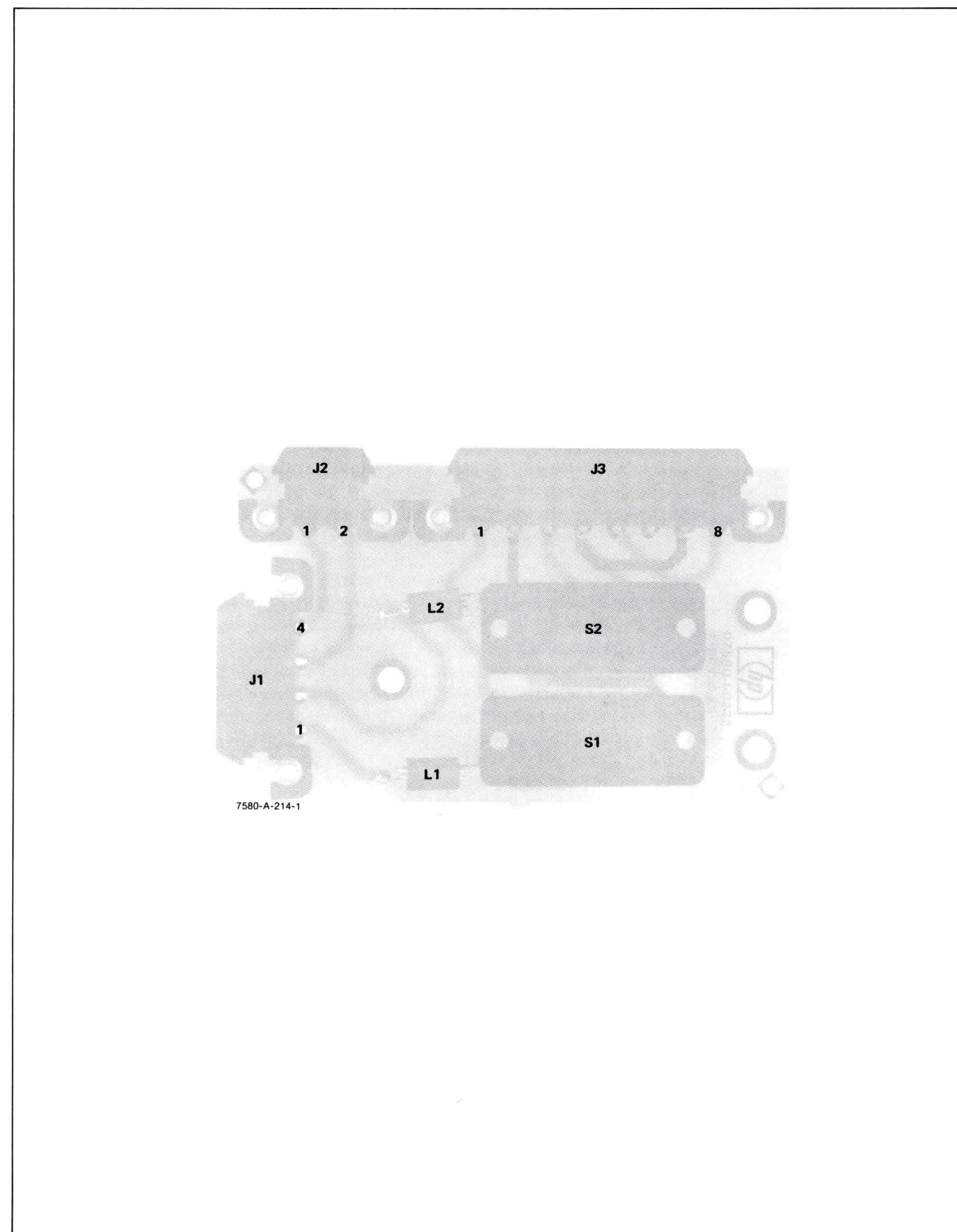


Figure 6-36. Primary Power PCA A14, Component Identification Diagram

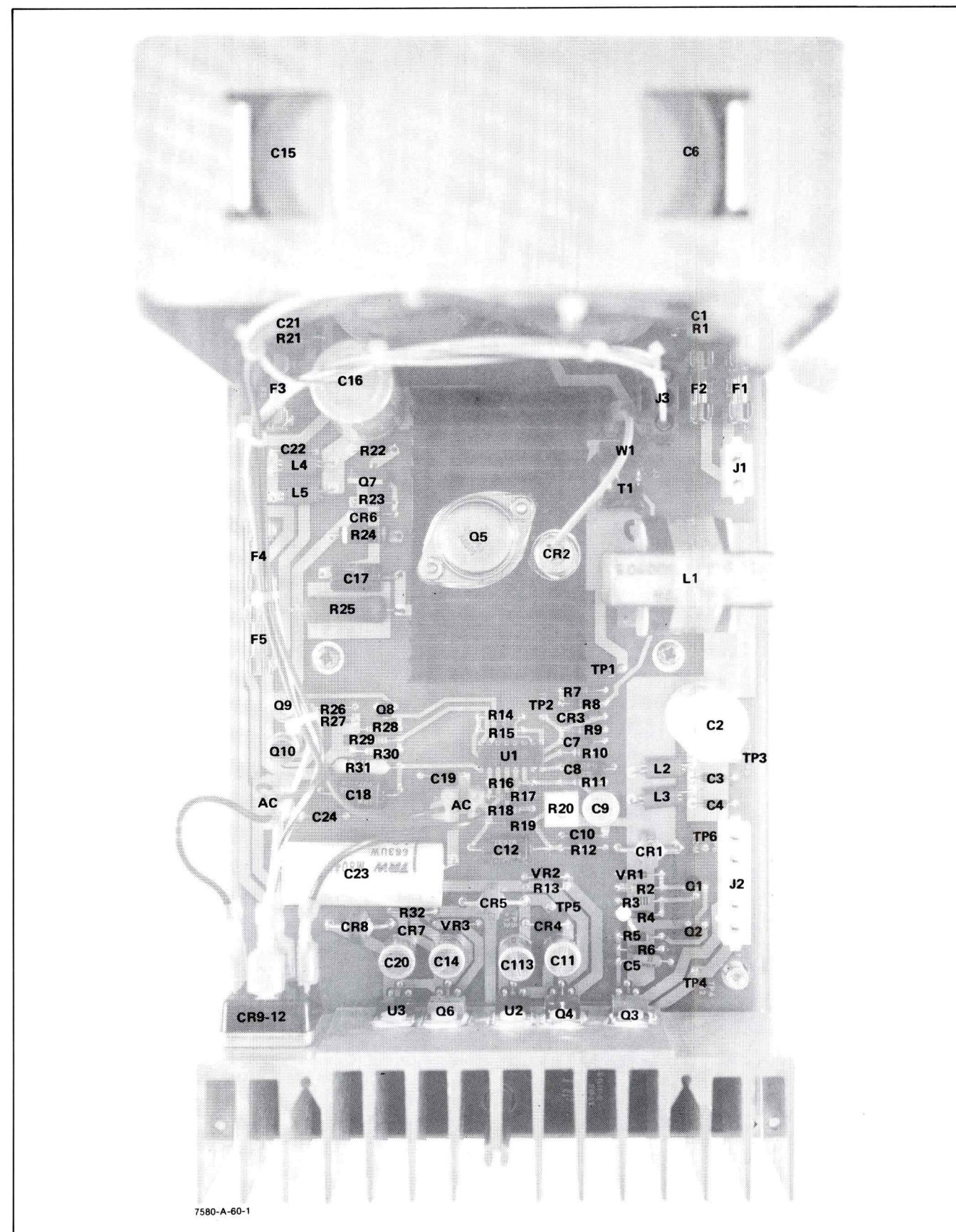
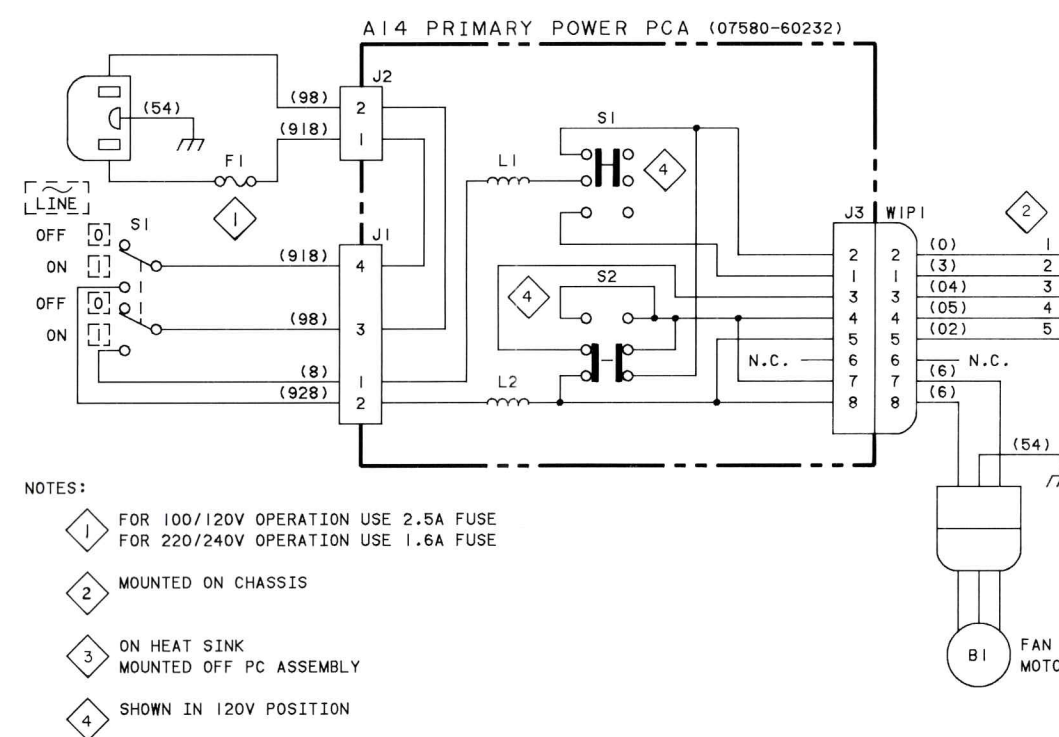


Figure 6-37. Power Supply PCA A15, Component Identification Diagram



APPENDIX A

HP-IB/RS-232-C (DUAL I/O) INTERFACE

A-1. INTRODUCTION

A-2. The Model 7580B HP-IB/RS-232-C (Dual I/O) Interface provides both an asynchronous serial I/O interface, conforming to EIA Standard RS-232-C and CCITT V.24, and a 16-line interface bus, utilizing the Hewlett-Packard Interface Bus (HP-IB) method of interfacing HP controllers, conforming to IEEE standard 488-1978. The Rear Panel PCA A1 provides connections to allow the plotter to be interfaced with terminals, computers, modems, and HP-IB controllers. The HP-IB circuitry on the Interface PCA A2 sets up data transfer circuits when addressed and provides the interface between the plotter bus and the Rear Panel PCA. The RS-232-C circuitry on the Interface PCA A2 converts the incoming serial data into parallel data for internal plotter use and converts the outgoing data from parallel to serial data.

A-3. HP-IB INTERFACE FUNCTIONS

A-4. The HP-IB circuitry provides an interface between the HP-IB external controller and the device (plotter). The HP-IB inputs and outputs conform to IEEE standard 488-1978. A list of the specific functions implemented in the Model 7580B plotter is given to facilitate correlation and quick reference to the IEEE standard.

- a. Functions implemented to IEEE standard 488-1978, Appendix C.

1. Source Handshake	SH1
2. Acceptor Handshake	AH1
3. Talker	T6
4. Listener	L3
5. Service Request	SR1
6. Parallel Poll	PP0, PP1, PP2
7. Device Clear	DC1
8. No Remote Local	RLO
9. No Device Trigger	DTO
10. No Controller	CO

- b. Device Clear causes the plotter to:

1. Complete any vector currently in process
2. Complete an up vector if queued

3. Convert a down vector to an up vector and complete
 4. Reset the Internal I/O PCA to begin accepting a new instruction
 5. Disable "TALK"
- c. Parallel Poll response is assigned by the HP-IB address switches located on the Rear Panel PCA A1 or the REMOTE configuration function. If the address is LO, the parallel poll response is PP0. LISTEN address 0 through 7 assigns Data Input/Output (DIO) lines 8 through 1, respectively, using PP2. All other listen addresses use response PP1.

A-5. BUS LINE IDENTIFICATION

A-6. A 16-line bus is used to carry data and control information between the plotter and the HP-IB external controller. The bus line is divided into three sets of signal lines as follows:

- a. Data bus — eight signal lines — DIO1 through DIO8.
- b. Data transfer control — three signal lines — (handshake).
- c. Interface management — five signal lines.

A-7. The data bus carries eight-bit data or control words in bit parallel, byte serial form. These words are transmitted bidirectionally and asynchronously. The three data transfer control lines, or "handshake lines," are used to control the transfer of information on the data bus. These lines are identified as follows:

- a. DATA VALID (DAV) — Used to indicate that valid information is available on the data bus.
- b. NOT READY FOR DATA (NRFD) — Used to indicate the readiness of the device (plotter) to accept information.
- c. NOT DATA ACCEPTED (NDAC) — Used to indicate the acceptance of information by the device (plotter).

A-8. The five interface management lines are used to provide an orderly flow of information across the interface bus. The five interface management lines are identified as follows:

- a. ATTENTION (ATN) and END or IDENTIFICATION (EOI) — Used to identify the nature of the information on the data bus. Data bus information is either a Command, Data, or Parallel Poll Response.

- b. SERVICE REQUEST (SRQ) — Used to indicate that the plotter needs attention.
- c. INTERFACE CLEAR (IFC) — Used to place the plotter in a known quiescent state.
- d. REMOTE ENABLE (REN) — Used to enable instruments to go into remote control.

A-9. SIGNAL FUNCTIONS

A-10. Positive true logic is used within the plotter circuitry. Negative true logic is used on the HP-IB lines. A capital letter N in front of a mnemonic, such as NRFD, shows an inversion for that line.

A-11. POWER-UP. Initially, when power is applied to the plotter, a POWER ON preset signal is generated in the power supply. This POWER ON preset signal causes a driver on the Processor PCA to generate a POWER-UP (PUP) signal which is used to clear flip-flops thus setting the plotter to a known quiescent condition. The DAC and RFD lines to the controller are sent passive true indicating this idle condition.

A-12. ACCEPTOR (LISTEN) HANDSHAKE SEQUENCE. When the controller is ready to transfer a control word on the data bus, it sends ATN true and EOI false. Control words are accepted by the plotter without processor intervention. When the plotter (acceptor) receives the above two signals, it starts the “handshake” sequence:

- a. Plotter indicates that it is ready to accept data by setting NRFD true and NDAC false.
- b. After NRFD has gone true, the controller places a data byte on the eight data lines and sets the DAV line true.
- c. After the DAV line has gone true, the plotter sets NRFD false, accepts the data, and sets NDAC true.
- d. After the NDAC line has gone true, the controller can set DAV false again and take the data off the lines. When DAV goes false, the plotter sets NDAC back to false and the sequence is ready to repeat with step a.

A-13. LISTEN FUNCTION. If the controller sends a plotter control word; DIO7 = false, DIO6 = true, and DIO1-DIO5 equal to the address switch settings of S3B-S3F, the LISTEN flip-flop is set true and any following data sent by the controller will be accepted by the plotter. Listen control words other than MY LISTEN ADDRESS (MLA) are ignored by the plotter. To terminate the LISTEN function, the controller sends an Unlisten Command; DIO6 = false, DIO7 = true, and DIO1-DIO5 = true.

A-14. Unlike control words, data transfer requires intervention by the processor to complete the transfer. The processor generated signals ready (rdy) and receive handshake (rhs) used in the data transfer sequence are shown in Figure A-1.

A-15. TALK FUNCTION. The talk logic circuitry provides the plotter with the capability to send data over the interface to the controller. This TALK function is only enabled when the plotter is addressed to talk by the controller. After being addressed, the HP-IB address comparator generates a MY ADDRESS signal and, with the decoded bit 7, which determines it is a talk address, activates the talk logic circuits. The plotter TALK function is deactivated whenever the controller puts any other talk address on the bus lines.

A-16. TALK HANDSHAKE. Data is transferred from the plotter to the controller using an interlocked handshake sequence similar to the acceptor handshake previously described. Refer to the Handshake Timing diagram, Figure A-1. The same three bus lines, DATA VALID (DAV), NOT READY FOR DATA (NRFD), and NOT DATA ACCEPTED (NDAC), are used as follows:

- a. The plotter, having been addressed as a talker, causes the processor to generate a new byte available (nba) signal which sets the talk logic gates and latches to set the DAV message to false.
- b. The controller, which is now the listener, makes the NRFD line false signifying its readiness to accept the message byte.
- c. The plotter sends the DAV message true indicating that it has put a valid message byte on the bus.
- d. The controller (listener) acknowledges that it has accepted the message byte by setting the NDAC line false.
- e. The plotter sets its talk logic circuits to set the DAV line false and the sequence is ready to repeat from step a.

A-17. SERVICE REQUEST. The SERVICE REQUEST (SRQ) allows the plotter to asynchronously request service from its controller. A service request is initiated when the plotter processor generates a request for service (rsv) which causes the HP-IB service request logic circuit to set the SRQ line true. This true SRQ state indicates over the interface that the plotter is requesting service.

A-18. The controller, upon detecting a service request, conducts a serial poll of all the devices on the bus that may have requested service. To initiate the serial poll, the controller transmits the universal command “SPE” (SERIAL POLL ENABLE); it then sequentially commands each device on the HP-IB to talk.

A-19. The SERIAL POLL ENABLE (SPE) command sets the serial poll mode state flip-flop when the controller sets the plotter as a talker. The plotter requests service by sending the status byte (DIO1-DIO7) with DIO8 always = 0. The controller looks at DIO7 to determine if the plotter was the device that set the SRQ line. The controller has the option of determining when or if a service request will be serviced and takes appropriate action. The use of the service request and the serial poll depends entirely on the make-up of each system and the devices involved.

A-20. PARALLEL POLL MODE. Parallel polling permits the status of up to eight devices on the HP-IB to be

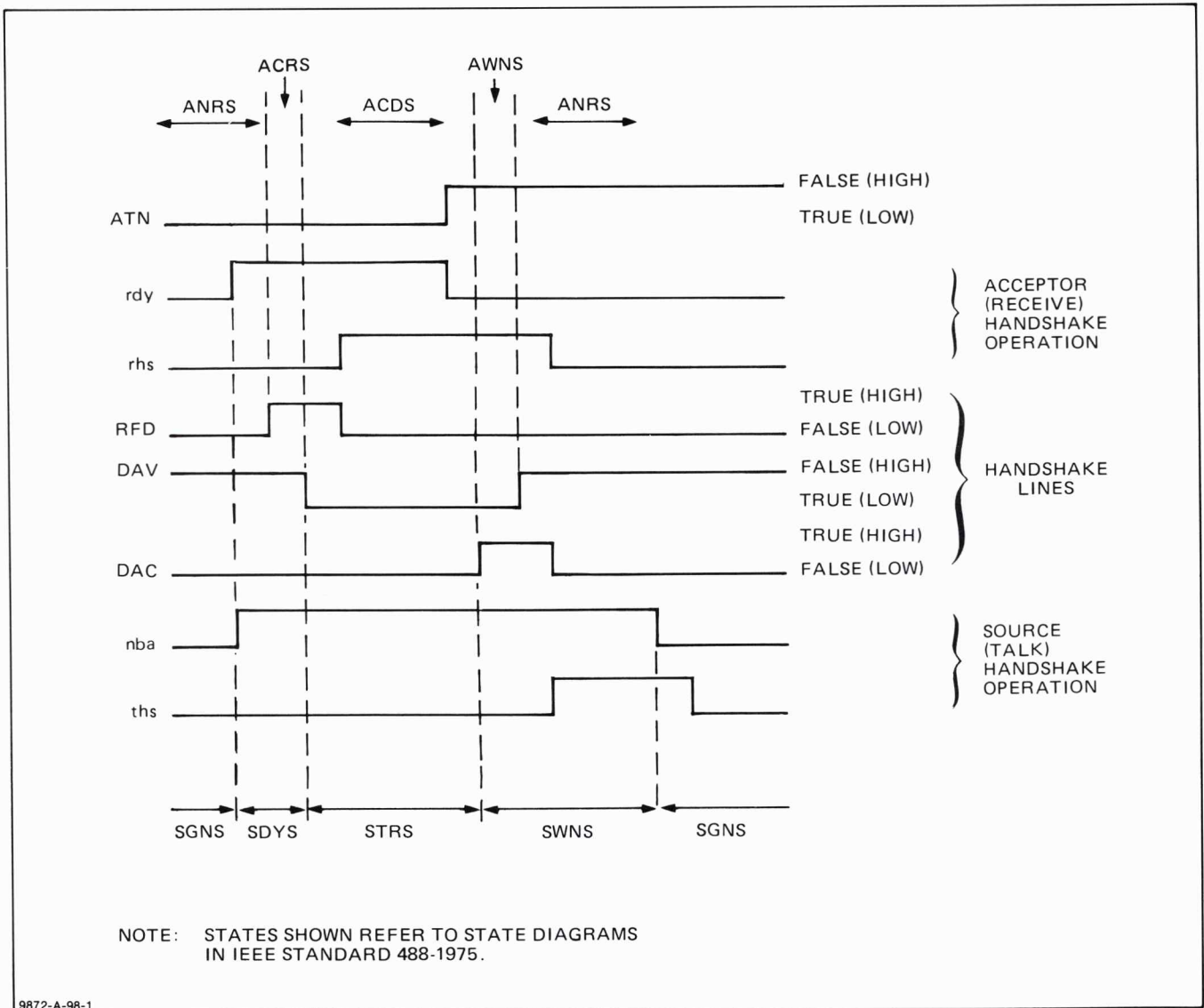


Figure A-1. HP-IB Data Transfer Handshake Timing

checked simultaneously. The operator assigns each device a data line (DIO1 through DIO8), which the device sets low during the parallel poll routine if it requires service. More devices can be handled, if desired, by sharing the use of each DIO line.

A-21. The parallel polling function allows the controller to periodically poll the instruments connected to the bus. The controller interrogates (polls) the instruments by sending EOI and ATN true. The plotter decodes the EOI and ATN messages and activates a parallel poll driver circuit. This driver circuit drives the selected DIO line low thus indicating to the controller that the plotter requires service. The DIO line bit pattern, in PP2, is set on the address switches located on the Rear Panel PCA. Also, PP1 can configure the line bit pattern for positive or negative 'sensing' of Parallel Poll Response.

A-22. DEVICE CLEAR (DCL) and SELECTED DEVICE CLEAR (SDC). The controller can set all devices on the HP-IB system to a predefined or initialized state by sending the universal command DEVICE CLEAR

(DCL). The controller can also set "selected devices only" on the HP-IB system to a predefined state by sending a SELECTED DEVICE CLEAR (SDC) command. Upon receiving either a SDC or a DCL command, the plotter decodes data lines DIO1-DIO7 and sets the respective SDC or DCL gates. The output of the enabled gate sets a DCL latch which requests the processor to go to an initialized state. The processor receives this request during its READ INTERFACE BUS (RDIB) cycle and determines when it will grant the request. The processor next causes the HP-IB control gate to output a clear acknowledge (cla) pulse to reset the data clear latch when the next WRITE INTERFACE BUS (WRIB) occurs.

A-23. RS-232-C WIRES/SIGNALS

A-24. The EIA RS-232-C/CCITT V.24 standard defines the 25 wires, and their functions, that must be used in the connecting cables between the plotter and the data terminal/host computer. However, only seven basic wires are used in the Model 7580B and these are coupled

through the Rear Panel PCA A1 to the Interface PCA A2. See Table A-1. The remaining wires bypass the plotter by being hardwired between the COMPUTER/MODEM and TERMINAL connectors on the rear panel. A male-to-male interface cable HP P/N 8120-3258 is supplied for connecting the plotter to the external controller.

A-25. THEORY OF OPERATION

A-26. HP-IB/RS-232-C (DUAL I/O) REAR PANEL PCA A1

A-27. The Rear Panel PCA provides connections that allow the plotter to be controlled by either HP-IB compatible controllers on the HP-IB interface lines or RS-232-C compatible controllers on the RS-32-C/CCITT V.24 interface lines. The Rear Panel PCA functional block diagram is illustrated in Figure A-4. The INTERFACE MODE switch on the rear panel selects the type of interface the plotter will respond to and must be set to correspond to the type of external controller interfacing being used. Two light emitting diode (LED) lamps on the rear panel indicate whether the plotter is in the HP-IB or RS-232-C interface mode. Zener diodes CR1, CR2, and power rectifier diodes CR3 through CR32 are used for electrostatic discharge protection.

A-28. Five operator selectable mode switches provide additional control of interfacing. The EMULATE/

NORMAL switch determines the mode of the plotter when in the REMOTE state through control of the front-panel functions. The EXPAND/NORMAL switch allows the operator to increase the plotting area to the pinch roller line of track, thus overriding the margin allowed by the paper edge sensor parameters. This expands the plot by reducing margins from 15 mm (on three sides) and 39 mm (on the fourth side) to 5 mm (on three sides) and 29 mm (on the fourth side). The STAND-ALONE/EAVESDROP switch determines whether the plotter will or will not automatically respond to commands. In the STAND-ALONE mode, the plotter responds normally to all recognized commands. In the EAVESDROP mode, data received on the computer/modem port is retransmitted through the terminal port and the plotter does not respond unless a "Plotter On" command is detected. The MONITOR MODE/NORMAL switch allows data that is received or transmitted by the plotter to be displayed (echoed) on the terminal. When the LOCAL/NORMAL switch is in the LOCAL position, the plotter is connected to the terminal and any further data from a host computer is ignored.

A-29. Five operator selectable HP-IB address switches (A1-A5) on the rear panel determine the bus address that the plotter will respond to. The address switch positions set the logic levels to the rear-panel status logic in the Interface PCA (A2). The LISTEN ONLY switch sets the plotter into one of two mutually exclusive

Table A-1. EIA RS-232-C/CCITT V.24 Wires/Signals

WIRE/SIGNAL NAME	MNEMONIC		FUNCTION	
	RS-232-C	CCITT V.24	MODEM	TERMINAL
Transmitted Data	BA	103	Outgoing data from the plotter.	Incoming data to the plotter from the terminal.
Received Data	BB	104	Incoming data to the plotter.	Outgoing data from the plotter to the terminal.
Request to Send	CA	105	Plotter activated, tells the modem to prepare to receive and retransmit data from the plotter.	Terminal activated, tells the plotter to prepare to receive data from the terminal.
Clear to Send	CB	106	Activated by the modem to tell the plotter that it is ready to receive and retransmit data from the plotter.	Activated by the plotter to tell the terminal that the plotter is ready to receive.
Data Set Ready	CC	107	Activated by the modem to tell the plotter that the modem is operational.	Activated by the plotter to tell the terminal that the plotter is operational.
Data Terminal Ready	CD	108.2	In normal mode, plotter activated to tell the modem that the plotter is operational. In DTR Bypass mode, signal is supplied by the terminal.	Activated by the terminal to tell the plotter that the terminal is operational.
Received Line Signal Detector	CF	109	Activated by the modem to tell the plotter that the modem is in communication with the host computer and detects the carrier signal.	Tied high (to simulate a modem) for terminals that require this line to be high.

configurations by invoking a routine wherein the plotter receives all data as a listener but cannot talk.

A-30. Five operator selectable RS-232-C mode and parity switches on the rear panel determine the plotter's operating status in the RS-232-C interface mode. The PARITY ON/OFF switch determines whether the plotter will, or will not generate parity bits. The PARITY ODD/EVEN switch sets up the plotter to respond with either odd or even parity check bits, providing the PARITY ON/OFF switch is in the ON position. The DUPLEX HALF/FULL switch is used to control the return or "echo" of data from the terminal or computer to the terminal or computer when the plotter is set in LOCAL or MONITOR MODE functions. The HARDWARE/MODEM switch determines the initialized state of the "Set Plotter Configuration" parameter and is only detected upon plotter power on. The DTR-BYPASS/NORMAL switch allows the DTR signal from the terminal to bypass the plotter and be routed directly to the modem or computer.

A-31. The BAUD RATE switch allows the operator to select any one of 16 fixed baud rates and must be set to the same baud rate as the external controller. The RESERVED position of the BAUD RATE selector is 'reserved' for an undefined baud rate, but is set for 9600 baud at present. When shipped from the factory, the plotter will generate two stop bits at all baud rates of 150 baud and below. One stop bit is generated for all baud rates greater than 150.

A-32. The CONFIDENCE TEST switch, when pressed, causes the plotter to invoke an internal diagnostic program, plot its confidence test plot, and light the front-panel lamps.

A-33. HP-IB/RS-232-C (DUAL I/O) INTERFACE PCA A2

A-34. The Interface PCA provides an interface between the external controller and the plotter. The various functions of the HP-IB and RS-232-C lines are described earlier in this section. The Interface PCA functional block diagram is illustrated in Figure A-4. A simplified

block diagram to facilitate understanding of the detailed description given here is shown in Figure A-2.

A-35. The data and control signals to and from the HP-IB go through the bus transceivers U9 and U7, respectively. The bus transceivers are enabled when power is applied to the plotter and directed to transmit or receive in response to the HP-IB commands by the General Purpose Interface Bus (GPIB) adaptor U6. The TALK ENABLE (TE) output of U6-21 directs the bus transceivers into either the transmit or receive mode. The CONTROLLER (CONT) output of U6-30 controls the direction of transfer of the bus transceivers for the bus management lines. All handshake requirements for the HP-IB are handled by the GPIB adaptor U6.

A-36. The GPIB adaptor U6 functions as a TALKER, LISTENER, or CONTROLLER. Communication with the plotter processor is via a memory mapped eight-bit data bus. A 16-bit bus is utilized by the GPIB adaptor to interface with HP-IB data and control buses. Input/Output connections for the GPIB adaptor are listed in Table A-2.

A-37. When the ATN input is high and the plotter is addressed to listen, the GPIB adaptor accepts and processes data on the DIO lines. A low ATN input allows interface commands to be sent over the DIO lines.

A-38. The plotter is shipped from the factory set to address 5 (decimal). This address may be changed to meet the requirements of a particular system. The plotter may also be set to LISTEN ONLY, using the LISTEN ONLY switch on the rear panel.

A-39. The GPIB adaptor $\overline{\text{CHIP ENABLE}}$ ($\overline{\text{CE}}$) signal is active when address bits A4 and A6 from the processor PCA are both low. When U6 is enabled and its $\overline{\text{WRITE ENABLE}}$ ($\overline{\text{WE}}$) input is low, data can be written by the processor into the GPIB adaptor, and when the DATA BUS IN (DBIN) input is high, data can be read by the processor from the GPIB adaptor. The READ or WRITE registers are selected by address bits A1, A2, and A3 at the register select (RS0-RS2) inputs on pins 6, 7, and 8 of U6, respectively.

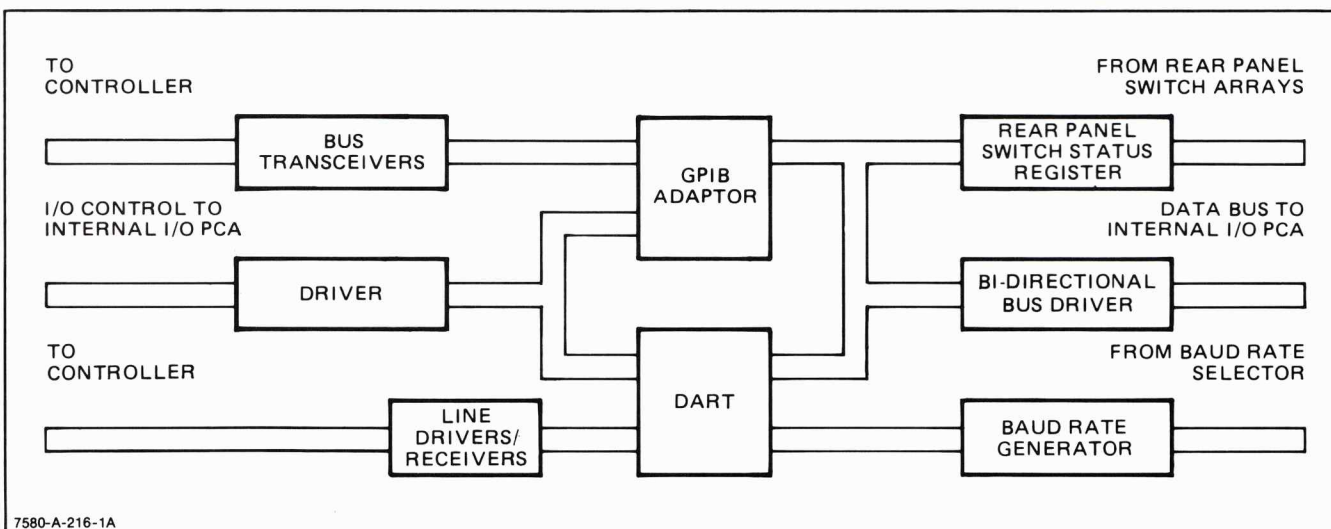


Figure A-2. HP-IB/RS-232-C (Dual I/O) Simplified Block Diagram

Table A-2. GPIB Adaptor U6 Input/Output Connections

PIN NO.	SIGNAL	DESCRIPTION
2	$\overline{\text{ACCGR}}$	$\overline{\text{ACCESS GRANTED}}$. Enables the byte onto the data bus.
3	$\overline{\text{CE}}$	$\overline{\text{CHIP ENABLE}}$. Enables the adaptor to read or write information.
4	$\overline{\text{WE}}$	$\overline{\text{WRITE ENABLE}}$. Processor writes data or commands to the adaptor.
5	DBIN	DATA BUS IN. Processor reads data or commands from the adaptor.
6-8	RS0-RS2	REGISTER SELECT LINES. Selects register addressed by processor.
9	$\overline{\text{INT}}$	Signals processor to branch to interrupt service routine.
10-17	BUS 0-7	Parallel data transfer bus between adaptor and processor.
18	CLK	4 MHz clock input for adaptor timing.
19	$\overline{\text{PUP}}$	Power ON $\overline{\text{PUP}}$ from Internal I/O PCA.
21	TE	TALK ENABLE. Control direction of data transfer of BUS TXCVRS.
22	$\overline{\text{REN}}$	$\overline{\text{REMOTE ENABLE}}$. Interface management line for enabling remote control.
23	$\overline{\text{IFC}}$	$\overline{\text{INTERFACE CLEAR}}$. Interface management line places plotter into a known quiescent state.
24	$\overline{\text{NDAC}}$	$\overline{\text{NOT DATA ACCEPTED}}$. Handshake line indicates data acceptance.
25	$\overline{\text{NRFD}}$	$\overline{\text{NOT READY FOR DATA}}$. Handshake line indicates readiness to accept information.
26	$\overline{\text{DAV}}$	$\overline{\text{DATA VALID}}$. Handshake line indicates valid data present on bus.
27	$\overline{\text{EOI}}$	$\overline{\text{END OR IDENTIFY}}$. Interface management line identifying information on data bus as data, command, or parallel poll.
28	$\overline{\text{ATN}}$	$\overline{\text{ATTENTION}}$. Interface management line specifying type of information on I/O lines.
29	$\overline{\text{SRQ}}$	$\overline{\text{SERVICE REQUEST}}$. Interface management line indicating plotter in need of attention.
30	$\overline{\text{CONT}}$	$\overline{\text{CONTROLLER}}$. Controls direction of transfer of bus management lines.
31-38	DIO1-8	Parallel data transfer lines between adaptor and external controller.

A-40. The $\overline{\text{ACCESS GRANTED}}$ ($\overline{\text{ACCGR}}$) input is tied high enabling the data onto the data bus.

A-41. A high on the $\overline{\text{INTERRUPT 2}}$ ($\overline{\text{INT2}}$) line from the GPIB interrupt logic signals the processor to branch to a plotter interrupt service routine.

A-42. The information on the HP-IB control and data lines is driven between the GPIB adaptor and the processor by the octal Bidirectional Interface Bus Driver (BIB) U3.

A-43. When the plotter is in a power-off condition, the TERMINAL and COMPUTER/MODEM ports are

internally connected in parallel. The eavesdrop capability is disabled. When the plotter is turned ON, the transfer of data to and from the plotter is allowed.

A-44. Since signals and data within the plotter are positive-true TTL levels, inverting line drivers and receivers are used in the RS-232-C input and output circuits to convert the logic and voltage levels. Table A-3 shows the levels required for RS-232-C systems. The received serial data and signals are input to U10 through line receivers U14 and U16. Conversely, the serial string data from U10 is driven to the rear panel by line drivers U8 and U15.

Table A-3. RS-232-C Signal Levels

	DATA CIRCUITS		CONTROL CIRCUITS	
	Mark	Space	Off	On
Binary State	1	0	1	0
Voltage Range	-5 V to -15 V	+5 V to +15 V	-5 V to -15 V	+5 V to +15 V

A-45. The Dual Asynchronous Receiver Transmitter (DART) U10 is a dual channel serial to parallel, parallel to serial converter/controller used in the asynchronous mode. In addition, the DART also provides modem control for both channels. The DART converts the incoming serial data into parallel data for use by the plotter processor and converts the outgoing data from parallel to serial string for the external controller. Input/Output connections for the DART are listed in Table A-4.

A-46. Address bit A2 supplies the CHANNEL A or B SELECT (B/A) input to pin 34 of U10 and defines which channel is accessed during a data transfer between the processor and the DART. A high on address A2 selects channel B, while a low on A2 selects channel A.

A-47. Address bits A3, A4, and A6 are used to supply the CHIP ENABLE (\overline{CE}) input for U10. A high on address bits A3 and A4 and a low on A6 cause the output of U4 pin 12 to go low. This low input to pin 35 of U10 enables the DART. When enabled, the DART accepts data or commands from the processor during a WRITE cycle or transmits data to the processor during a READ cycle.

A-48. The CONTROL or $\overline{DATA\ SELECT}$ (C/\overline{D}) input specifies whether the type of information being transferred between the DART and the processor is control or data information. A high on address bit A1 instructs the C/\overline{D} input to select control type information transfer, and a low on A1 specifies data type information transfer.

Table A-4. DART U10 Input/Output Connections

PIN NO.	SIGNAL	DESCRIPTION
1-4, 37-40	BUS0-7	Parallel data transfer bus between DART and processor.
5	\overline{INT}	Signals processor to branch to interrupt service routine.
6	IEI	INTERRUPT ENABLE IN. Indicates device priority in service routines.
8	\overline{MI}	$\overline{MACHINE\ CYCLE\ ONE}$. Low active used for instruction fetch or interrupt acknowledge.
11	\overline{RIA}	$\overline{RING\ INDICATOR\ A}$. Enables channel A receivers and transmitters.
12	RXDA	RECEIVE DATA A. Input for serial data from external system.
13	\overline{RXCA}	$\overline{RECEIVER\ CLOCK\ A}$. From baud rate generator, 32X data rate.
14	\overline{TXCA}	$\overline{TRANSMITTER\ CLOCK\ A}$. From baud rate generator, 32X data rate.
15	TXDA	TRANSMIT DATA A. Output for serial data to external system.
16	\overline{DTRA}	$\overline{DATA\ TERMINAL\ READY\ A}$. Handshake line to external controller.
17	\overline{RTSA}	$\overline{REQUEST\ TO\ SEND\ A}$. Handshake line to external system.
18	\overline{CTSA}	$\overline{CLEAR\ TO\ SEND\ A}$. Enable transmitter when active low.
20	CLK	4 MHz clock input for DART timing.
21	\overline{PUP}	Active low disables receivers, transmitters, and interrupts.
23	\overline{CTSB}	$\overline{CLEAR\ TO\ SEND\ B}$. Enable transmitter when active low.
24	\overline{RTSB}	$\overline{REQUEST\ TO\ SEND\ B}$. Handshake line to external system.
25	\overline{DTRB}	$\overline{DATA\ TERMINAL\ READY\ B}$. Handshake line to external controller.
26	TXDB	TRANSMIT DATA B. Output for serial data to external system.
27	\overline{RXTXCB}	$\overline{RECEIVER-TRANSMITTER\ CLOCK\ B}$. From baud rate generator.
28	RXDB	RECEIVE DATA B. Input for serial data from external controller.
32	\overline{RD}	$\overline{READ\ CYCLE\ STATUS}$. When active, indicates a read cycle in progress.
33	C/\overline{D}	CONTROL OR $\overline{DATA\ SELECT}$. Defines word on bus as data or control.
34	B/\overline{A}	CHANNEL \overline{A} OR B SELECT. Defines channel accessed for data transfer.
35	\overline{CE}	$\overline{CHIP\ ENABLE}$. Enables DART to read or write information.
36	\overline{IORQ}	$\overline{INPUT/OUTPUT\ REQUEST}$. Used for directional control of data transfer.

A-49. When the address bit A6 goes low and the READ/WRITE (R/ \overline{W}) signal goes high, the output of U5 pin 11 goes low. This signals the READ CYCLE STATUS (\overline{RD}) input on pin 32 of U10 that a READ operation is in progress.

A-50. The INPUT/OUTPUT REQUEST (\overline{IORQ}) signal is active (low) when address bit A6 is low. \overline{IORQ} is used in conjunction with $\overline{B/\overline{A}}$, $\overline{C/\overline{D}}$, \overline{CE} and \overline{RD} signals to transfer instructions and data between the processor and the DART. When \overline{CE} , \overline{RD} , and \overline{IORQ} are all active (low), the channel selected by $\overline{B/\overline{A}}$ transfers data to the processor during a READ operation. When \overline{CE} and \overline{IORQ} are active (low) and \overline{RD} is inactive (high), the channel selected is written to by the processor with either control or data information as specified by the $\overline{C/\overline{D}}$ input.

A-51. The INTERRUPT ENABLE IN (\overline{IEI}) and MACHINE CYCLE ONE (\overline{MI}) inputs to the DART are tied high to indicate that no other devices of higher priority are being serviced by the processor interrupt routine.

A-52. A low on the INTERRUPT 1 ($\overline{INT1}$) line from the DART interrupt logic signals the processor to branch to a plotter interrupt service routine.

A-53. The information on the RS-232-C control data lines is driven between the DART and the processor by octal Bidirectional Interface Bus driver (BIB) U3.

A-54. The TRANSMITTER AND RECEIVER CLOCK inputs, (\overline{RXCA} , \overline{TXCA} , and \overline{RXTXCB}) of U10 are tied to the receiver output frequency (FR) of the baud rate generator U12.

A-55. The dual baud rate generator, U12, is a combination baud rate clock generator and frequency divider. An external crystal, Y1, supplies the input frequency of 5.0688 MHz to pins 1 and 18 of U12. The baud rate generator outputs a 50% duty cycle clock with frequencies approximately 32 times the standard baud rates marked on the rear panel. See Table A-5. U12 selects the proper frequency for the desired baud rate in response to the status of the binary weighted selection lines (BR1, BR2, BR4, BR8) from the BAUD RATE switch on the rear panel. The binary weighted selection lines provide the receiver address (RA, RB, RC, RD) inputs for U12. A high level input strobe (STR) on U12 pin 8 loads the receiver addresses into the address register of the baud rate generator. The resultant receiver output frequency (FR) from U12 pin 3 is the TRANSMIT/RECEIVE clock inputs to the DART U10.

A-56. Switch select register U13 is a three state DQ type flip-flop register that inputs data from the processor to the rear-panel switch select lines. U13 is enabled when the output of U4 pin 6 goes high. U13 also passes the baud rate selector data on the bus lines to the receiver address inputs on pins 4, 5, 6, and 7 of the baud rate generator U12.

Table A-5. Baud Rate Frequencies

RECEIVE ADDRESS				BAUD RATE	ACTUAL FREQUENCY 32X CLOCK
RD	RC	RB	RA		
0	0	0	0	50	1.6 kHz
0	0	0	1	75	2.4
0	0	1	0	110	3.52
0	0	1	1	134.5	4.303
0	1	0	0	150	4.8
0	1	0	1	200	6.4
0	1	1	0	300	9.6
0	1	1	1	600	19.2
1	0	0	0	1200	38.4
1	0	0	1	1800	57.6
1	0	1	0	2400	76.8
1	0	1	1	3600	115.2
1	1	0	0	4800	153.6
1	1	0	1	7200	230.4
1	1	1	0	9600	298.16
1	1	1	1	RESERVED	N/A

A-57. Information on the switch data bus from the rear panel is input to the three-state bus interface register U11. Resistor network RN1 pulls the switch bus line inputs high for use by the register. The inhibit input to pin 12 of U11 is tied low to prevent switching of the register outputs to a logic 0 (zero) should the output disable to pin 4 also be low. A high on the output disable control pin 4 permits common busing of the three-state outputs for the plotter internal bus.

A-58. Diode CR1 is provided as a stop bit jumper which may be removed to supply two stop bits at all baud rates. Discreet diodes CR2-CR6 are unspecified configuration jumpers supplied for possible future use.

A-59. The octal Bidirectional Interface Bus driver (BIB) U3 is shown in simplified form in Figure A-3. The BIB is enabled by address bit A6 and the direction of data flow controlled by the READ/WRITE (R/W) signal. A high level READ passes data from the GPIB adaptor to the processor through the data bus and a low level WRITE passes data from the processor to the GPIB adaptor. High impedance inputs and three-state outputs prevent the BIB from interfering with communication on the data bus when the enable input signal is high.

A-60. Input/Output (I/O) control instructions from the plotter internal circuits are driven to the DART and the GPIB adaptor by driver U2. The logic switching is controlled through NAND gate arrays U4 and U5 and hex inverter U1. A PUP signal from the processor is driven by U2 to the DART and GPIB adaptor. The PUP signal also clears the registers in the GPIB adaptor and the DART and disables all other interrupts.

A-61. STOP BITS

A-62. When shipped from the factory, the plotter will generate two stop bits at all baud rates of 150 baud and below. One stop bit is generated for all baud rates greater than 150. If two stop bits are required at all baud

rates, diode CR1 on the Interface PCA A2 must be removed.

WARNING

Removal of the stop bit diode CR1 should be performed only by service trained personnel who are aware of any electrical shock hazards involved.

A-63. To remove the stop bit diode CR1 on the Interface PCA, the following steps must be performed:

- a. Turn the plotter OFF.
- b. Remove the front cover.
- c. Remove the Interface PCA A2. See Section II of this manual for PCA identification.
- d. Clip out or desolder the diode CR1.
- e. Install the Interface PCA.

A-64. PARTS LISTS

A-65. Parts located on the HP-IB/RS-232-C (Dual I/O) Rear Panel PCA A1 and Interface PCA A2 are identified in Tables A-6 and A-7, respectively.

A-66. SCHEMATIC DIAGRAM

A-67. The HP-IB/RS-232-C Rear Panel PCA components are identified in Figure A-5. The HP-IB/RS-232-C Interface PCA components are identified in Figure A-6.

A-68. The HP-IB/RS-232-C (Dual I/O) Rear Panel PCA A1 and Interface PCA A2 schematic diagram is illustrated in Figure A-7.

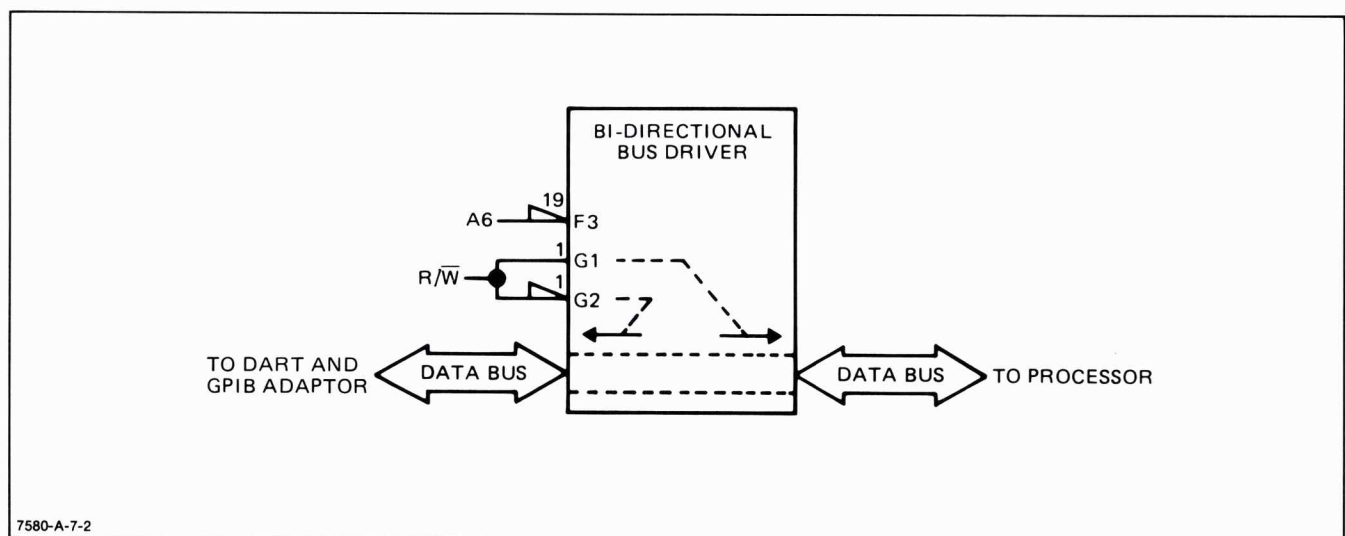


Figure A-3. Bidirectional Bus Driver

Table A-6. Parts List, HP-IB/RS-232-C (Dual I/O) Rear Panel PCA A1

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A1	07585-60275	3	1	PCA, REAR PANEL	28480	07585-60275
A1CR1	1902-0976	4	2	DIODE-ZNR 14.5V PD=5W TC=+.088% IR=5UA	11961	1.5SE18C
A1CR2	1902-0976	4		DIODE-ZNR 14.5V PD=5W TC=+.088% IR=5UA	11961	1.5SE18C
A1CR3-A1CR32	1901-0731	7	30	DIODE-PWR RECT 400V 1A	28480	1901-0731
A1DS1	1990-0487	7	2	LED-LAMP LUM-INT=1MCD IF=20MA-MAX BVR=5V	28480	5082-4584
A1DS2	1990-0487	7		LED-LAMP LUM-INT=1MCD IF=20MA-MAX BVR=5V	28480	5082-4584
A1J1	1252-1323	8	1	CONNECTOR 24-PIN F MICRO RIBBON	28480	1252-1323
A1J2	1251-4946	5	2	CONNECTOR 25-PIN F D SUBMIN	28480	1251-4946
A1J3	1251-4946	5		CONNECTOR 25-PIN F D SUBMIN	28480	1251-4946
A1J4	1251-6067	5	1	CONNECTOR 60-PIN M POST TYPE	28480	1251-6067
A1R1	0698-3443	0	2	RESISTOR 287 1% .125W F TC=0+-100	24546	C4-1/8-T0-287R-F
A1R2	0698-3443	0		RESISTOR 287 1% .125W F TC=0+-100	24546	C4-1/8-T0-287R-F
A1S1	3101-2199	1	1	SWITCH-SL SPDT MINTR 6A 125VAC PC	28480	3101-2199
A1S2	3101-2630	5	1	SWITCH-SL 5-1A DIP-SLIDE-ASSY .05A 30VDC	28480	3101-2630
A1S3	3101-2629	2	1	SWITCH-SL 6-A1 DIP-SLIDE-ASSY .05A 30VDC	28480	3101-2629
A1S5	3101-2627	0	1	SWITCH-SL 5-SPDT DIP-SLIDE-ASSY .05A	28480	3101-2627
A1S6	3101-1690	5	1	SWITCH-ROTARY 16 POS BCO	28480	3101-1690
A1S7	3101-0451	4	1	SWITCH-PB SPST-NO MOM .5A 115VAC BLK-BTN	28480	3101-0451
A1U1	1906-0248	1	5	DIODE-ARRAY 40V 400MA	28480	1906-0248
A1U2	1906-0248	1		DIODE-ARRAY 40V 400MA	28480	1906-0248
A1U3	1906-0248	1		DIODE-ARRAY 40V 400MA	28480	1906-0248
A1U4	1906-0248	1		DIODE-ARRAY 40V 400MA	28480	1906-0248
A1U5	1906-0248	1		DIODE-ARRAY 40V 400MA	28480	1906-0248
	5020-6297	8	2	MISCELLANEOUS SPACER-HP1B CONNECTOR	28480	5020-6297

Table A-7. Parts List, HP-IB/RS-232-C (Dual I/O) Interface PCA A2

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A2	07585-60327	8	1	PCA, INTERFACE	28480	07585-60327
A2C1	0160-3847	9	17	CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
A2C2	0180-0100	3	2	CAPACITOR-FXD 4.7UF+-10% 35VDC TA	56289	150D475X9035B2
A2C3	0180-0228	6	1	CAPACITOR-FXD 22UF+-10% 15VDC TA	56289	150D226X9015B2
A2C4	0180-0100	3		CAPACITOR-FXD 4.7UF+-10% 35VDC TA	56289	150D475X9035B2
A2C5	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
A2C6	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
A2C7	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
A2C8	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
A2C9	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
A2C10	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
A2C11	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
A2C12	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
A2C13	0160-4574	1	6	CAPACITOR-FXD 1000PF +-10% 100VDC CER	28480	0160-4574
A2C14	0160-4574	1		CAPACITOR-FXD 1000PF +-10% 100VDC CER	28480	0160-4574
A2C15	0160-4574	1		CAPACITOR-FXD 1000PF +-10% 100VDC CER	28480	0160-4574
A2C16	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
A2C17	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
A2C18	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
A2C19	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
A2C20	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
A2C21	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
A2C22	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
A2C23	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	28480	0160-3847
A2C24	0160-4574	1		CAPACITOR-FXD 1000PF +-10% 100VDC CER	28480	0160-4574
A2C25	0160-4574	1		CAPACITOR-FXD 1000PF +-10% 100VDC CER	28480	0160-4574
A2C26	0160-4574	1		CAPACITOR-FXD 1000PF +-10% 100VDC CER	28480	0160-4574
A2CR1- A2CR6	1901-0040	1	6	DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A2J1	1251-6846	8	1	CONNECTOR 60-PIN M POST TYPE	28480	1251-6846
A2R1	0683-2225	3	2	RESISTOR 2.2K 5% .25W FC TC=-400/+700	01121	CB2225
A2R2	0683-2225	3		RESISTOR 2.2K 5% .25W FC TC=-400/+700	01121	CB2225
A2R5	0698-3444	1	1	RESISTOR 316 1% .125W F TC=0+-100	24546	C4-1/8-T0-316R-F
A2RN1	1810-0277	3	1	NETWORK-RES 10-SIP2.2K OHM X 7	01121	210A222
A2RN2	1810-0231	9	1	NETWORK-RES 8-SIP2.2K OHM X 7	01121	208A222
A2TP1	1251-4637	1	2	CONNECTOR-SGL CONT PIN .031-IN-BSC-SZ	28480	1251-4637
A2TP2	1251-4637	1		CONNECTOR-SGL CONT PIN .031-IN-BSC-SZ	28480	1251-4637
A2U1	1820-1416	5	1	IC SCHMITT-TRIG TTL LS INV HEX 1-INP	01295	SN74LS14N
A2U2	1820-2024	3	1	IC DRVR TTL LS LINE DRVR OCTL	01295	SN74LS244N
A2U3	1820-2075	4	1	IC MISC TTL LS	01295	SN74LS245N
A2U4	1820-1282	7	1	IC GATE TTL LS NAND TPL 3-INP	01295	SN74LS10N
A2U5	1820-1281	2	1	IC DCDR TTL LS 2-TO-4-LINE DUAL 2-INP	01295	SN74LS139N
A2U6	1820-2548	6	1	IC-TMS 9914	28480	1820-2548
A2U7	1820-2485	0	1	IC RCVR TTL LS BUS OCTL	01295	SN75160N
A2U8	1820-0509	5	2	IC DRVR DTL LINE DRVR QUAD	04713	MC1488L
A2U9	1820-2483	8	1	IC RCVR TTL LS BUS OCTL	01295	SN75161N
A2U10	1820-2872	9	1	IC NMOS TRANSMITTER/RECEIVER	28480	1820-2872
A2U11	1820-2945	7	1	IC INV CMOS HEX	28480	1820-2945
A2U12	1820-3134	8	1	IC GEN NMOS BAUD RATE DUAL	28480	1820-3134
A2U13	1820-1977	7	1	IC FF TTL LS D-TYPE POS-EDGE-TRIG PRL-IN	01295	SN74LS374N
A2U14	1820-0990	8	2	IC RCVR DTL NAND LINE QUAD	01295	SN75189AJ
A2U15	1820-0509	5		IC DRVR DTL LINE DRVR QUAD	04713	MC1488L
A2U16	1820-0990	8		IC RCVR DTL NAND LINE QUAD	01295	SN75189AJ
A2Y1	0410-0733	7	1	CRYSTAL-QUARTZ 5.0668 MHZ HC-18/U-HLDR	28480	0410-0733
				MISCELLANEOUS		
	0340-0164	9	1	INSULATOR-XSTR NYLON	28480	0340-0164
	0510-0843	2	2	PIN-SPL .062-IN-DIA .25-IN-LG SST	28480	0510-0843
	1200-0654	7	2	SOCKET-IC 40-CONT DIP DIP-SLDR	28480	1200-0654
	4040-0753	0	2	EXTR-PC BD GRN POLYC .062-BD-THKNS	28480	4040-0753

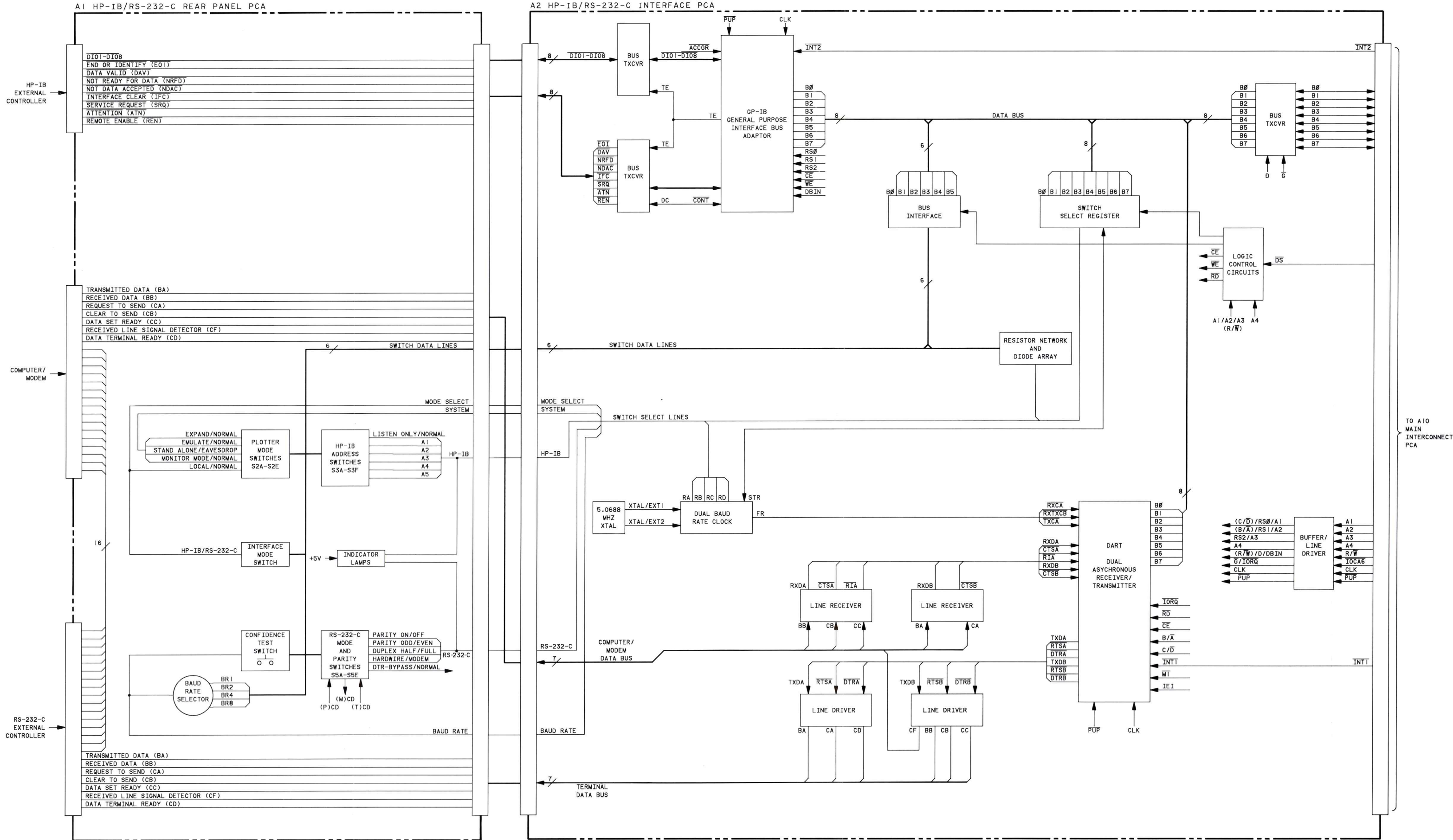


Figure A-4. HP-IB/RS-232-C (Dual I/O) Functional Block Diagram

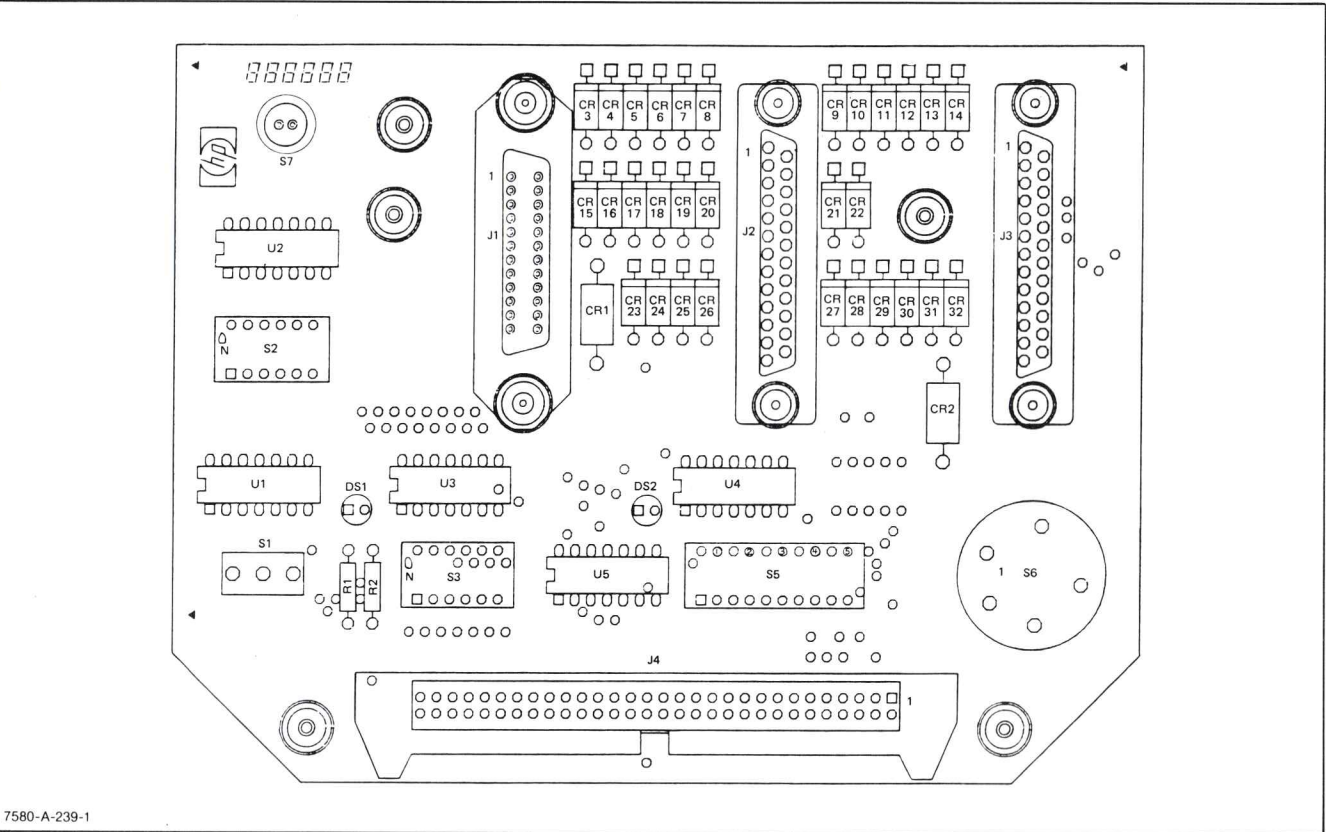


Figure A-5. Rear Panel PCA A1 Component Identification Diagram

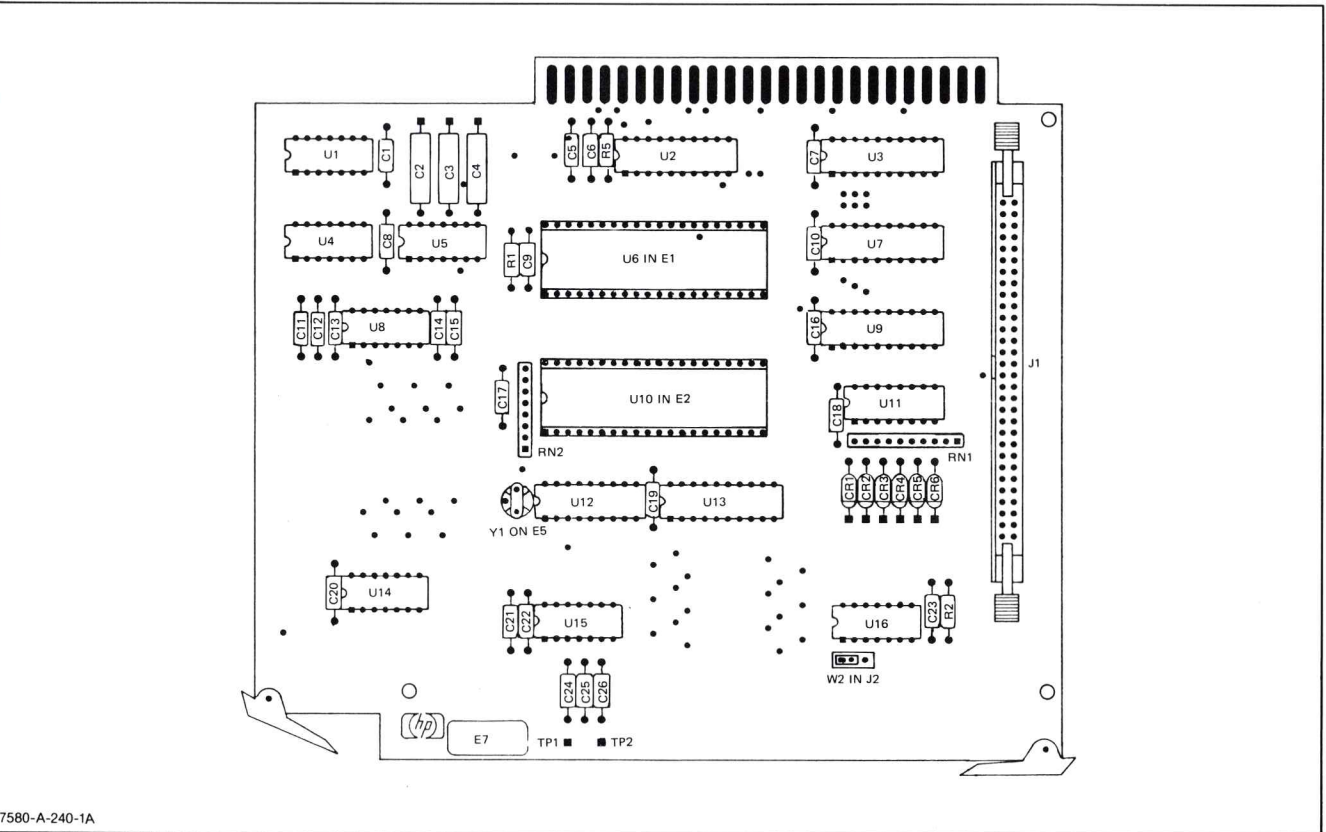


Figure A-6. Interface PCA A2 Component Identification Diagram

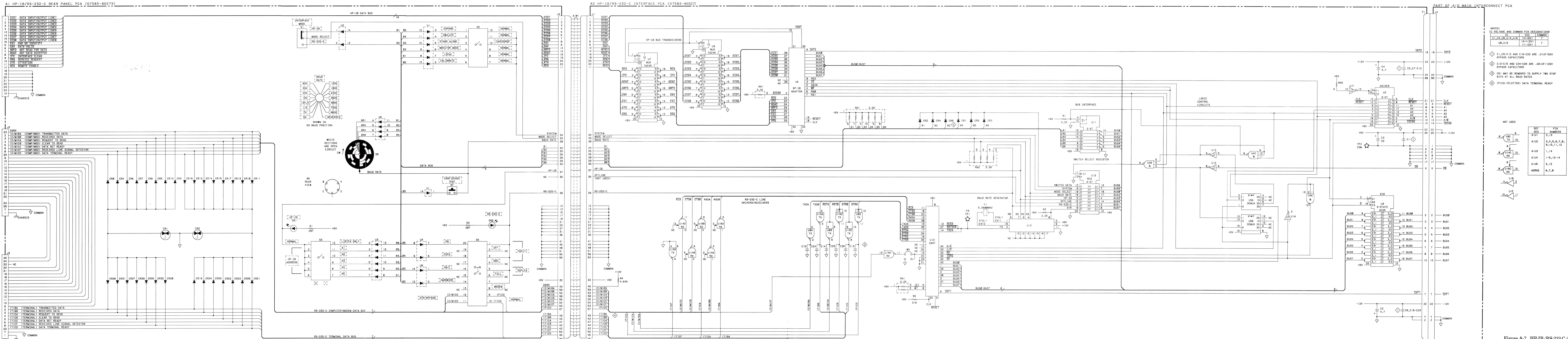


Figure A-7. HP-IB/RS-232-C (Dual I/O) Rear Panel PCA A1 and Interface PCA A2, Schematic Diagram

NOTES

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